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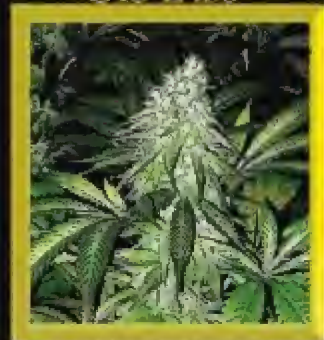
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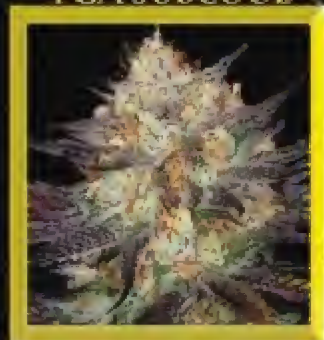
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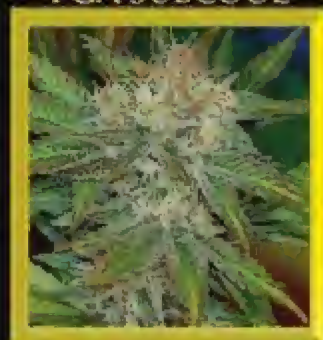
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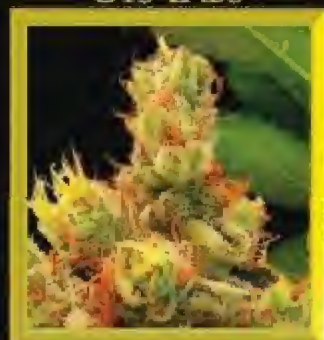
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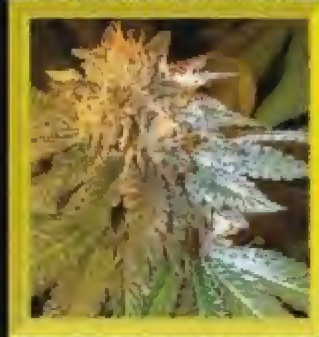


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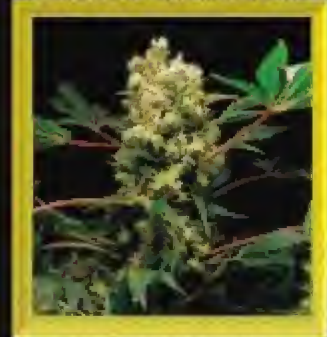
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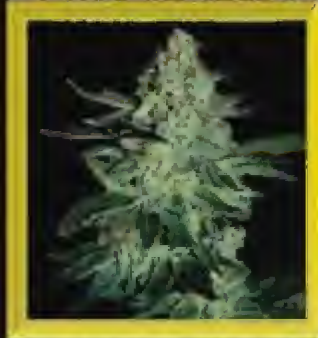
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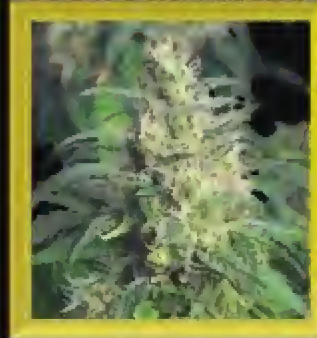
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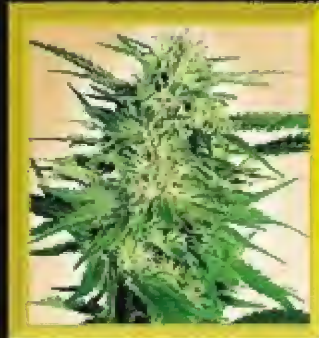
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EVOLUTIONARY WAR

So California's Proposition 19, which would have basically legalized adult use in the Golden State, didn't pass. Is it the end of the fight? Hardly—new legalization initiatives are already being crafted. We're not wringing our hands and crying, "Woe is us!" We have discovered, in this long, ridiculous battle to return marijuana to its rightful place in the world, that we have patience.

The mainstreaming of marijuana is an evolutionary process. Each year, the evidence pointing to its extraordinary medical benefits grows. And each year, more and more people rethink the government propaganda they've been fed all their lives and start to discard their prejudices. As the mainstreaming of marijuana continues, our laws will only get better—because we have the stamina to ensure that they do.

Like the Lennon/McCartney song says, "I've got to admit it's getting better / A little better all the time." Every aspect of the cannabis industry is evolving, tailored to two very specific markets: cultivators and consumers. In fact, every issue we publish seems to address a new breakthrough of one kind or another. Cultivators can find out about the latest bulbs and ballast technology in this issue, and get a better understanding of the nutrients that will bring them success. Consumers can gain a deeper knowledge of marijuana economics as we examine the ever-evolving world of outdoor-pot prices. (Actually, that's an area that really could get "a little better"—the steep drop in outdoor prices has yet to be passed on to consumers.)

Of course, there are many out there who maintain their faith in "cannabis creationism," the tenets of which seem to be that "God purposely created an illegal plant" and that "marijuana is bad because it *is* illegal." As you can see, there's no room for evolution in this religion.

So our job is to educate, educate, educate, and make things "a little better" for the plant "all the time." Evolution is a process, and it will take longer than seven days—or 70-plus years of pot prohibition—to create a harmonious world for cannabis.

Dan Skye

Dan Skye
Executive Editor

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-Frank Barnes, Michigan

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HIGH TIMES

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FEATURES

38 OUTDOOR ODYSSEY

BY DAN SKYE

It's getting harder and harder to be an outdoor gardener these days: Prices keep dropping as more and more growers try to make a go of it every year. But are these plummeting prices justified? We're literally "on the ground" to find out.

48 STEPPING STONED

BY DAVID BIENENSTOCK

How Prop. 19 lifted the tide of drug-law reform nationwide and pushed marijuana legalization in California one step closer to inevitability.

52 THE BULB & BALLAST BREAKDOWN

BY NICO ESCONDIDO

Today's crowded marketplace can be a bit overwhelming when it comes to grow lights and ballasts. To add to the confusion, revelations about the incompatibility of standard HID bulbs and digital electronic ballasts are frustrating growers all over the world. Once again, Nico goes technical to give a breakdown of the issues, as well as an overview of the most essential bulb and ballast types in use for indoor grow ops today.

60 TRICHOME TECH 2011: INSIDE THE RESIN FACTORY

BY CHRIS SIMUNEK

HIGH TIMES grow masters Trichome Tech give us a guided tour of their newly built, never-before-seen commercial production facility. Learn the ins and outs of growing medical-grade cannabis hydroponically on a massive scale.

78 CANNABIS & NUTRIENTS

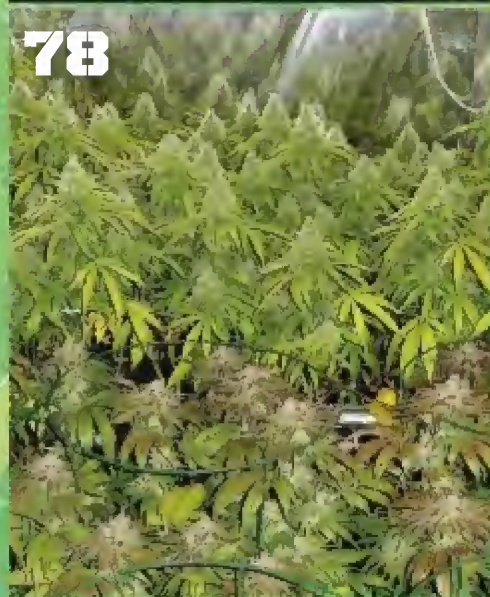
Continuing this month's indoor-grow theme, cultivation correspondent Erik Biksa weighs in on what it takes to create optimal feeding programs for your cannabis garden. Covering all the essential macro- and micronutrients, including CO₂ and oxygen, this article is a great starting point for newbies—and a useful refresher course for old gurus. There's more than meets the eye when it comes to garden nutrition, and Biksa outlines the important links between solid-state nutrients and the growroom atmosphere as a whole.

86 THE HIGH TIMES INTERVIEW: FAITH EVANS

BY DAN SKYE

She's got a string of platinum records behind her and new horizons ahead. R&B legend Faith Evans sits down for a candid take on the world of hip-hop and offers an honest appraisal of adult cannabis use, medical and otherwise.

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EDITED BY DAN SKYE

Shelby Chong; New dad; Dutch scratch 'n' sniff; Bright light; Pot-smoking protester; Toasted toaster; Smokin' snowboard; Pot racism; MJ and gay rights; Lo-fi bands; Black Sheep; Rusko; Reviews; Brain Damage Control; Band of the Month; Miss HIGH TIMES; Almost Infamous.

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Pix of the Crop; Cannabis Clinic; Munchies; NORMLizer; Freedom Fighter; Dr. Mitch; SSDP Report; Understanding Substrates and Soil Components, by Herb Spadowski, Ph.D.; Gear/Hot Products; Dear Danko.

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COVER: FREEBIE STRAIN: GOD'S GIFT
INSET OF SHELBY & TOMMY CHONG: KATY WINN
CENTERFOLD: FREEBIE STRAIN: CANDY KUSH

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feedback

LEGALIZE IT ALREADY!

I am writing this letter to address the issue of legalization. Marijuana (*Cannabis sativa*) is a plant that is rolled up and smoked in a manner similar to tobacco. In 2000, 18.1 percent of all deaths in the US were related to tobacco consumption, while 3.5 percent of deaths the same year were due to alcohol. The very fact that marijuana hasn't been recorded as the cause of a single fatality is one good reason why it should be legalized.

Under the Controlled Substances Act, marijuana is a Schedule I drug, meaning that it supposedly has no medicinal value and can very easily be abused. Other drugs that are classed as Schedule I include morphine, heroin, mushrooms and LSD—all of which have been recorded as the cause of death for more than one individual. By making marijuana legal, it would allow law enforcement to take its focus off arresting every weed smoker and concentrate on far more serious crimes such as robbery and murder. Taxpayer dollars could then be spent on something more useful than keeping people incarcerated on marijuana charges.

Marc Knuckles

FIGHT FOR YOUR RIGHT

We're all a little disappointed with the outcome of Cali's Prop. 19, to say the least. But rather than admit defeat, we who believe in nature's perfect medicine will *never* give up the fight! This is just the beginning of the end, right? This has simply brought the whole issue even more into the limelight. Nature's perfect medicine must be freed at last! My question, though: Is outright legalization actually the answer? I believe this medicine should be available to *anyone* who chooses to use it responsibly, and not made "illegal" with the threat of incarceration or worse! So why not pursue this whole subject more along the lines of the medical-marijuana program and say, "Okay, if you want to use marijuana (for whatever reason), then you must be 21 years old and register with your state in order to receive a card (i.e., license) making it 'legal' for you to possess, grow and use this medicine"—simple as that! If you're caught abusing the system, there will be repercussions. Also, you must re-register (for a small fee) every year or two and can be subject to some kind of review if the state feels the need.

I personally would have a hard time seeing marijuana become "legal" simply for recreational use and found in every corner store and gas station. Cannabis is still medicine—a very special medicine—and should be controlled somewhat. We all know that it's a lot more useful and beneficial than alcohol and, obviously, there has to be a reasonable answer to the whole subject that everyone can agree on. But thanks to all who stand up for their rights and beliefs, and thanks to HIGH TIMES and all those behind the magazine who have never given up the fight.

Michigan Rick



This ain't the end of the fight! Check out our election roundup, "Stepping Stoned," on page 48.

I applaud your balls. In this time of people kowtowing to the government, it's refreshing to see anyone stand up to the bullshit. Further, I commend your allowing readers to post messages and give real opinions without the need to log in and be counted on some rolls that may one day come back to haunt us all.

I'm an old man now, too far past my prime to carry any fight to the enemy. It seems a pity—I'm a former veteran of two branches of our government, and I believed that we had the greatest country in the world and that ours was a just and righteous cause.

Please keep the faith and realize that, while most people in this country would love to stand with you and be counted, they're so scared of what the cost might be that they're frozen in fear.

This is why HIGH TIMES is so necessary. I salute the entire lot of you and hope, if not in my lifetime, then at least one day you see an end to the legalization battle.

Long life and ultimate success.

James Dooley

SECRET STASH

Today I bought my first HIGH TIMES magazine. I got home and ran to the bathroom to read it. (I have to hide the fact that I read it.) I was so happy, I was in there for about an hour. Then I realized that I wasn't happy—I wasn't happy that I had to hide this magazine about a plant and so much more. This stigma about weed has gotten so bad that I (like many others) can't even tell my closest friends, let alone family, that I smoke pot, and it's probably saved me more than anyone can imagine. We really need to stick together in these rough times, and your magazine helps out tremendously. Thank you, HT, and everyone who supports marijuana.

Dylan T. from Jersey

ERRATA

In the February 2011 issue, Allen St. Pierre's birthday is noted as July 1, 1945. His birth year is actually 1965, making him 46 years young.

Also, in the December 2010 issue, Chernobyl made the Top 10 Strains of the Year, and I couldn't be happier. However, the Arcata cut was listed as the mom when, in fact, we actually found a cutting that's quite different and turns a vivid, dark red color, but it doesn't produce late-term male stamens like the Arcata TW cutting. Chernobyl is actually Trainwreck x Trinity x Jack the Ripper.—Subcool

Send your letters to: Feedback c/o HIGH TIMES, 419 Park Avenue South, 16th floor, New York, NY 10016. Email: hteditor@hightimes.com. We reserve the right to edit for length and clarity.

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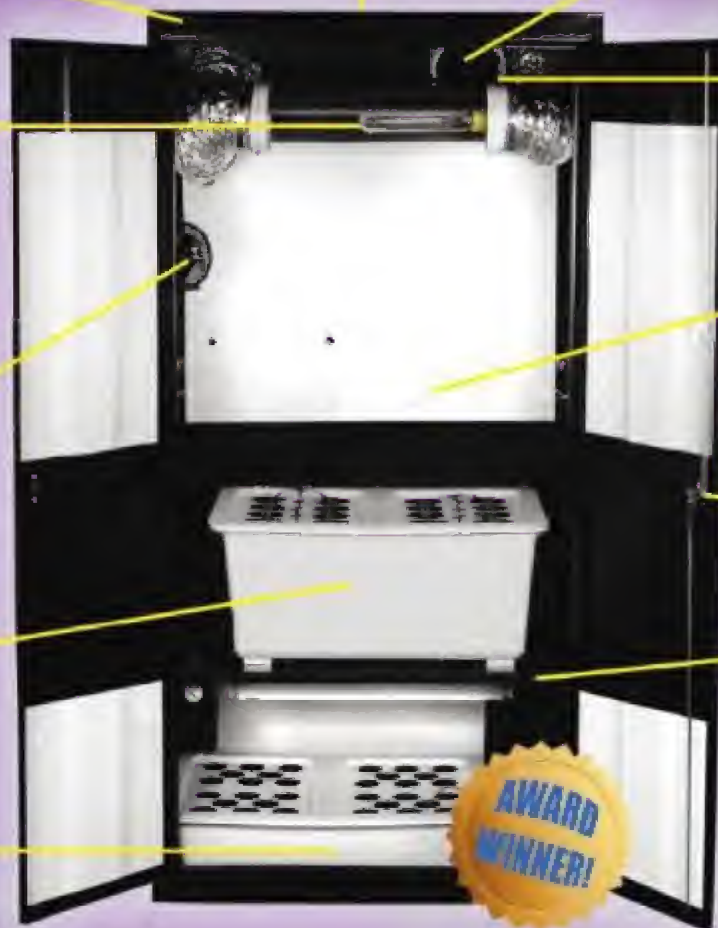


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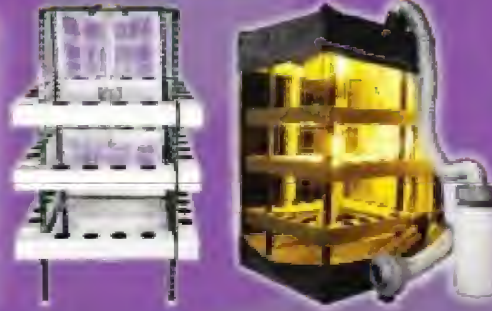
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JUST WHAT THE DOCTOR ORDERED

Laughter and living on the edge keep Shelby Chong and her man, Tommy, running on high octane.

You don't smoke pot. As a nonsmoker, how do you view the battle to get marijuana legalized?

Current pot laws are based on lies and rooted in racism. I'm very disappointed that Prop 19 didn't pass in California. Maybe they should have named it better, like Prop 420. Then all the stoners would've remembered which proposition to vote for. It's confusing enough going to the polls!

Why do you choose not to smoke?

I don't need to smoke pot. I'm stoned every day. If you live with Tommy Chong and entertain a Cheech & Chong audience, you're on a constant contact high.

What are your tips for staying healthy and young looking?

Exercise. When Tommy and I are not on the road doing shows, I work out at least two hours a day. I love taking ballet and ballroom classes. I love the way I feel after a difficult class. I have trouble working out in a gym; I can only last 30 minutes because it bores me. Then, of course, you have to watch your diet. Sugar is so addicting and it's a challenge to eat healthy when you travel. Another tip: drink hot water and lemon after every meal. It's great for your digestion and your skin. Last but not least, put moisturizers on constantly during the day and always wear sunscreen. My new favorite moisturizer is pure coconut oil. It's cheap and you can eat it, rub it all over your body, and it's even great for your hair. Weed is great if you are the least bit stressed, as stress is extremely aging. Stay high, exercise, eat healthy, and stay out of the sun. P.S: A little Botox goes a long way. Don't forget to laugh, because laughter keeps you young.

How do you and Tommy remain a strong couple?

We both like to live on the edge. We love to do crazy things and not live a normal lifestyle. I need constant change and challenges in my life. Tommy is the perfect partner for that kind of lifestyle. We are not afraid to take chances and we still act like we're in our twenties. He keeps me excited with his stoner way of thinking. He is very generous and loving and I'm lucky to have him as my lifelong partner. Also, I'm sure that all of those great acid trips we had together helped create a strong and loving bond between us in the beginning. ✨

Shelby opens the Cheech & Chong: Light Up America & Canada tour. Visit cheechandchong.com.

A bud a day keeps the blues away!



Support for getting high is at an all-time high!

HIGH SUPPORT FOR LEGAL POT

Last October, the venerable Gallup Poll released its latest survey on marijuana legalization, reporting that a record 46 percent of Americans (18 and older) support marijuana legalization for recreational use—as opposed to legal medical marijuana support, which polled at an overwhelming 70 percent support. Almost as significant, a new low of 50 percent oppose legalization; in 2009 it was 54 percent.

As with most hot-button issues in America, support varies depending on region. An outright majority approve of legal pot in the western US, while the more conservative Midwest and South—the states with the harshest pot laws—seem less likely to embrace legalization.

Compare these numbers to the first Gallup pot survey in the late 1960s, when nearly 80 percent of Americans opposed its legalization. Those numbers endured until 2000, when nearly a third of Americans were reported to support legal pot. Now, 61 percent of all adults under age 30 want pot legal.

Conservatives and Republicans demonstrated the most resistance to nationwide legalization with only 30 percent in support. Liberals polled at 72 percent support. Also, for the first time ever a majority of men (51 percent) now support legal pot. Women, who are less likely to toke, are also less likely to support cannabis legalization: only 41 percent are said to be in favor.

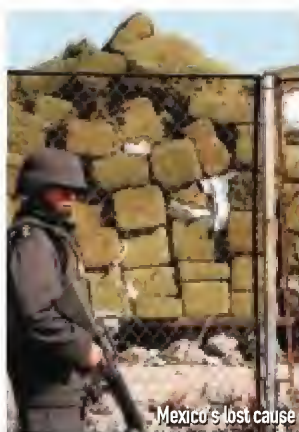


ARIZONA LEGALIZES!

Arizona has become the 15th state to pass a medical marijuana law. Voting on the measure was extremely close; the final tally wasn't achieved until two weeks after Election Day, passing with a margin of only 4,341 votes. The new law allows patients with diseases including cancer, HIV/AIDS, Hepatitis C and any other "chronic or debilitating" disease that meets state guidelines to purchase 2.5 ounces of marijuana every two weeks, or grow plants. Additionally, dispensaries may now operate, but no more than 124 statewide.

LEAKING THE TRUTH

At the end of last year, an endless stream of supposedly secret US State Department cables were made public by WikiLeaks. Several classified and secret memos posted on media websites revealed the US government's deep-seated belief that Mexico's Drug War is a terrible failure. One memo cites: "Prosecution rates for organized crime-related offenses are dismal; 2 per cent of those detained are brought to trial. Only 2 per cent of those arrested in Ciudad Juarez have even been charged with a crime." And in a memo dated October, 5, 2009, then-Undersecretary for the Interior Geronimo Gutierrez Fernandez, who oversaw domestic security, said the Drug War is "damaging Mexico's international reputation, hurting foreign investment, and leading to a sense of government impotence."



Mexico's lost cause

Nelson mugs again.

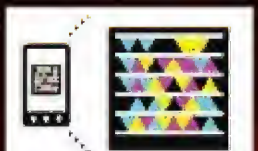


WILLIE'S WAKE'N'BUST

It was nine in the morning when the tour bus of country music legend Willie Nelson pulled into a checkpoint in Sierra Blanca, TX late last year. As any dedicated stoner knows, 9 AM is a perfect time for toking up, a great way to greet the day. Unfortunately, waking and baking is illegal in most parts of the US.

Upon smelling pot wafting from the windows, they boarded the bus and found six ounces. Willie calmly announced the weed was his. The charge was downgraded from a felony to a misdemeanor.

Exclusive interview with Willie:



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EXPECTANT DAD BUSTED

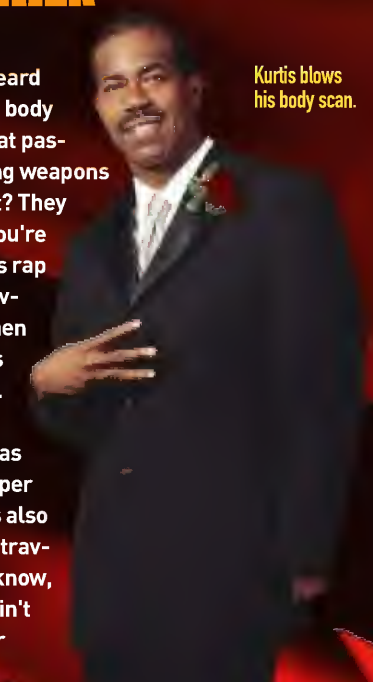


Your wife is in labor and you're stressed out. There's a baby on the way! So what would you do to chill out? If you're like most stoner dads-to-be, you keep yourself medicated. That's exactly what a Uniontown, PA man did. Unfortunately, a nurse tak-

ing a cigarette break in the hospital parking lot reported the smell of pot to police. When the future father was busted in his car toking up, he told cops: "I am having a baby, and I wanted to catch a buzz."

BODY SCANNER BLUES

Folks, if you haven't heard yet, airports are using body scanners to ensure that passengers aren't carrying weapons or bombs. Guess what? They also reveal whether you're carrying your stash, as rap star Kurtis Blow discovered late last year, when he was scanned at Los Angeles International. He was carrying less than an ounce so he was only issued a citation, per California law. He was also permitted to continue traveling. But as all of us know, the rest of the world ain't California. So consider yourself warned!



Kurtis blows his body scan.



SMOKIN' BOARDS

Snowboarding and weed—they go together like peanut butter and jelly. Mmmm ... peanut butter and jelly, with marshmallows and Doritos and—

Wait, what were we talking about?

Oh, right—snowboards ... like this bud-festooned model from Smokin' Snowboards. It's an ultra-exclusive board, part of a limited-edition series. Based on the Superpark model from Smokin', it features a true twin-tip shape, reverse camber and Magne Traction. Boarders will understand the lingo—but even if you don't, your board will give you instant cred!

Visit smokinsnowboards.com.



SCRATCH 'N' SNITCH

In Holland, city officials in Rotterdam and The Hague have distributed about 30,000 pot-scented scratch'n'sniff cards in the hope that citizens will assist them in busting grow ops. The cards read: "Assist in combatting cannabis plantations." The cards also list police numbers and offer telltale signs of cultivation like buzzing sounds, suspicious electrical connections, and closed curtains. Authorities say there are 40,000 illegal grow ops in Holland.

LET THERE BE LIGHT!

One of the more vexing dilemmas in the world of stonerdom is how to eliminate all those telltale signs of toking, especially—smoke! But the bright folks who make the Ionic Bulb may have finally come up with the answer. In fact, the Ionic Bulb is positively magical: It removes smoke and odors in just minutes by emitting a healthier, more natural light full of negative ions that attach themselves to pollutants and quickly neutralize them. You'll also save money *and* energy, since the Ionic Bulb uses just a quarter of the wattage of standard bulbs to produce the same amount of light. A single bulb works in a 100-square-foot area and will eliminate smoke, dust, pollen, pet dander, odors and allergens.

Visit newionicbulb.com.



GET TOASTED

At least once a month, it seems, someone in America undergoes a religious experience wherein a likeness of Jesus or the Virgin Mary suddenly appears on a screen door or a slice of toast.

But let's talk about miracles you can believe in! The new toasters from Burnt Impressions will turn your morning meal into a breakfast of champions. Tokers from all walks of life will come flocking to your kitchen when you serve them

toast with a pot-leaf design scorched onto every slice. And as a helping of extra jam, Burnt Impressions is offering a special hemp toaster every 10 days on eBay and will donate 100 percent of the proceeds to NORML and similar nonprofits.

Visit burntimpresions.com.



ZACH'S COOL MOVE

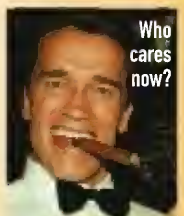
In support of Prop 19, actor/comedian Zach Galifianakis toked up on HBO's *Real Time with Bill Maher* on the eve of the election. Before lighting up, he said: "It's a tricky thing politically to jump on that bandwagon, 'cause I think that maybe people see it as taboo still."

Later he blurted out: "Omigod! Look at those dragons!" Once the audience stopped laughing, he added: "That's my point—I think that's what people think of it."

Later he blurted out: "Omigod! Look at those dragons!" Once the audience stopped laughing, he added: "That's my point—I think that's what people think of it."

OUTGOING HONESTY

Arnold Schwarzenegger, made a final appearance as governor of California on NBC's *The Tonight Show* shortly after Prop. 19 failed. Host Jay Leno asked him if signing a bill in September 2010 that reduced misdemeanor possession to a mere infraction might have hurt Prop 19. Said the Governor: "Absolutely."



Who cares now?

Arnold, who publicly opposed Prop. 19 while in office, added: "I think the [infraction] law we passed was good. No one cares if you smoke a joint or not."

It might have been nice if you'd said that earlier—like when you had power.

ITALIAN RAPSCALLION

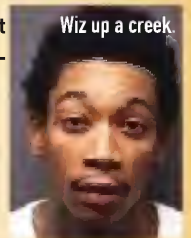
Italian Prime Minister Silvio Berlusconi continues to set new lows as a world leader. He's made racist comments about Obama, denigrated gays, consorted with prostitutes, and is now accused of using his private jet to fly in pot for sex parties at his villa. Investigators interviewed witnesses who report that pot was provided for at least 25 young women. No one saw Silvio smoking. Obviously, he was otherwise engaged.



Slithering Silvio.

TOUGH RAP

Following a show at East Carolina University, rapper Wiz Khalifa was busted on his tour bus for possession of 60 grams of pot. Wiz was charged with a felony count of trafficking and possession of drug paraphernalia. His bail for the 60 grams: \$300,000—a harsh reminder of what justice is like for most pot smokers in America.



Wiz up a creek.



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A FEW DUMB MEN

Maybe you missed it, but the winner of 2010's "What were they thinking?" award went jointly to Ramone Hollins, Cory Young and Darius Thomas. They're three active duty Army soldiers from Fort Carson, CO who were busted in November for allegedly breaking into Rocky Road Remedies, a Colorado Springs dispensary.

Using crowbars for entry, the trio suddenly found themselves locked inside the shop after Rocky Road's automatic security system sealed the doors right after the trio broke in with crowbars. Closed-circuit camera captured the panicked soldiers in ski masks desperately trying to get out, running around "like rats trapped in a maze," said the dispensary manager. Police arrested them on suspicion of second-degree burglary.

Officials at Fort Carson had no comment on the potential fate of the trio, but they're likely headed for a world of trouble: dishonorable discharge from the Army and permanent loss of military benefits. Even worse, double jeopardy doesn't apply in this case; all three can be tried in both military court and civilian municipal court. They could potentially be convicted and sentenced separately in both courts, resulting in longer prison time and additional punishments.

The soldiers told police they planned to destroy the marijuana—not smoke or sell it.



Some marijuana missions go awry.



Canadian activist Sam Mellace takes up on TV.

RIGHTEDOUS PROTEST

In October, Sam Mellace, a Canadian medical-marijuana patient and activist, made headlines by smoking a joint in the public gallery of the House of Commons (the Canadian equivalent of the House of Representatives) in Ottawa. Mellace was protesting government delays of up to seven months in approving licenses for medical-marijuana patients, as well as the fact that topicals and edibles aren't exempted from med-pot regulations. Later that night, he appeared on the CBC-TV news program *Power and Politics* and lit up on the air to re-create the ultimate in nonviolent protest.

Mellace had previously generated controversy when his own med-pot license was approved for a whopping 60 grams a day, which he needs to make the skin cream and butter used to treat his wife's lung cancer. Mellace himself suffers from issues resulting from a bout with leukemia, as well as chronic pain from a car accident. He now grows over 250 plants in British Columbia.

Currently, over 4,000 Canadians have been approved to use medical marijuana. Health Canada, the country's federal health department, sets daily consumption limits for each patient, who can then buy cannabis from a government supplier, grow their own or find a grower. However, research indicates that most medical-marijuana patients haven't signed up for the federal pot program and don't buy their medicine from the government, resulting in wasted tax expenditures.

POT POISONING? NOT LIKELY

After eight junior high school students in Los Angeles had negative reactions to pot brownies last November, news reports claimed the kids were being treated for "possible marijuana poisoning." In truth, the incident probably resulted in wrong-headed treatment—because pot isn't poisonous, never has been, and never will be.



For the record, some of the Carver students complained of a rapid heartbeat (a natural side-effect of pot) and nausea. But as University of Colorado at Colorado Springs biology professor and cannabis researcher Dr. Robert Melamede makes clear: "There does not appear to be any scientific reality for a general term 'cannabis poisoning.' The closest thing to a true negative physiological consequence of cannabis use is hyperemesis."

Cannabinoid hyperemesis syndrome—generally associated with chronic pot use, not teens eating brownies as a one-time lark—is marked by recurrent severe nausea, persistent vomiting, and abdominal pain. A hot bath/shower provides temporary relief of symptoms, but cessation of cannabis use is the only solution to completely terminate the hyperemesis. Scientists remain baffled as to why an antiemetic substance (one that alleviates nausea) such as cannabis should cause hyperemesis in some people. But they do know one thing—pot is not poisonous.

"There are probably people whose biochemistry does not interface well with cannabis-induced changes," Dr. Melamede suggests. "However, everything I know says that a bit of up-regulating of the endocannabinoid system is good for most people."

REEFER RACISM

California may lead the nation in medical-marijuana culture, but simple possession arrests in the state are still escalating, and minorities continue to be busted for pot at a disproportionately higher rate than white people, according to a joint report issued in October 2010 by the NAACP and the Drug Policy Alliance entitled *Arresting Blacks for Marijuana in California: Possession Arrests in 25 Cities, 2006-08*.

Despite the title, the study also includes pot arrests for Latinos. It found that in some parts of the state, minorities were arrested for weed up to 12 times more



frequently than whites. As for California's two largest cities, blacks were arrested for pot possession at almost six times the rate of whites in San Diego, and at seven times the rate of whites in Los Angeles. Moreover, these racially unbalanced arrests occurred in every county and almost every police department in California. However, according to US Department of Health and Human Services stats for 2004 to 2007, whites of all ages report using marijuana more than either Latinos or African-Americans.

The study avoids accusing individual police officers of racism, but it does suggest an institutionalized racial bias in law enforcement. Stephen Gutwillig of the Drug Policy Alliance clarifies: "[Officers] are assigned to certain neighborhoods, designated as 'high crime,' that are home to blacks and Latinos. It's a self-perpetuating system in which cops primarily stop and search large numbers of young people in black and Latino neighborhoods, find small amounts of marijuana, easily meet their arrest and citation quotas, and therefore justify continuing these practices."

The study indicates that over the last 20 years, 850,000 arrests for possession of less than an ounce were made in California; half a million of those took place in the last 10 years. Ironically, every category of actual serious crime has been declining in California since 1990.

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TRAILBLAZERS

Medical marijuana would not be where it is today without the courageous work of gay-rights activists. By Mark Miller

Thanks to its wild and often lawless past, which came with being a port town during the 1849 Gold Rush, San Francisco had already developed, by the early 20th century, a reputation for being far more tolerant than the rest of the nation at a time when homosexuality was still illegal. San Francisco's remote location from the rest of more conservative America, coupled with its unique international and urbane sensibilities, made it a logical place for gay Americans to establish a safe (and politically active) haven.

Ironically, it was World War II that spiked the city's gay and lesbian population; San Francisco became a major destination for those discharged by the US military for being gay from 1941 to '45. (At that time, the military's policy towards gays and lesbians was more like "We'll ask—and you'd better tell!") Gays and lesbians outed by the War Department (as it was called then) were reluctant to return home to the moral intolerance of the times.

The same societal atmosphere that made San Francisco relatively gay-friendly also spawned the counterculture of the 1950s Beats (including the openly gay poet Allen Ginsberg) and the 1960s hippie movement, which included a more politicized and radical gay and lesbian element. When the hippie scene turned ugly with hard drugs and violence, gays and lesbians moved from Haight-Ashbury to the nearby Castro District, transforming it into the modern "Gay Mecca" that it remains today.

Marijuana has always been part of the fabric of gay culture in San Francisco, but its use was purely for pleasure in those hedonistic days. The upward mobility and political power wielded by gays in San Francisco was unprecedented in American history, culminating in the 1977 election of Harvey Milk to the San Francisco Board of Supervisors—the first openly gay man elected to public office in California. Milk would undoubtedly have supported medical marijuana; in 1978, he publicly endorsed San Francisco's Proposition W, which passed with 64 percent of the vote and made marijuana-related arrests the lowest police priority in the city.

The gay-rights scene in San Francisco went from transcendence to tragedy with the November 1978 assassination of Milk (and gay-friendly Mayor George Moscone) by fellow Supervisor Dan White, an ex-cop who represented the one element still openly hostile to gays in San Francisco—the police. When White received a ludicrously lenient sentence, gays took to the streets of San Francisco in what was dubbed the "White Night" riots of May 21, 1979.

Indeed, it was a harbinger of bad times to come. The first case of Acquired Immune Deficiency Syndrome (AIDS) in the US was officially recorded in 1980, when Ken Horne of San Francisco reported to the Centers for Disease Control with Kaposi's sarcoma, a cancer that causes patches of unsightly tissue to grow on the arms, mouth and other organs. At first, the disease was called GRID (Gay-Related Immune Deficiency), and no one knew much about



The "White Night" riots of 1979 were a harbinger of bad times to come but the gay community had become united.

it other than that it was mysteriously killing otherwise healthy young, gay males.

By the mid-1980s, AIDS had developed into a wide-scale crisis in the San Francisco gay community, with thousands infected with HIV (the virus that leads to AIDS). One of the most devastating aspects of the disease was AIDS wasting syndrome, characterized by an involuntary loss of body weight, prolonged diarrhea, weakness and fever. Wayne Justmann, a former HIGH TIMES Freedom Fighter of the Month and long-time San Francisco medical-marijuana activist, recalls the uncertainty of the times during the emerging AIDS crisis and the social stigma that developed—a stigma that was nearly as devastating as the disease itself.

Diagnosed with HIV in 1988, Justmann describes the hardships that people like him faced: "The straight community, or those in the gay community who did not have HIV/AIDS, shunned individuals known to have the virus, or when sores appeared on the faces and bodies of the victims of this new and unknown virus," he says. "Many HIV-

positive individuals were torn and tormented by the fact of their condition. People were worried about the jobs they had, wondering would they be fired, or agonizing over telling family members of their condition. In the early days of this outbreak, uncertainty abounded in every direction. The city was frozen, with young men and women hospitalized and/or dying with the virus."

And when the gay community turned to the authorities and mainstream medicine, little help was found. "The San Francisco Department of Public Health tried their best to respond, but there were no simple solutions," Justmann says. "The drugs and other medications were too few to choose from and a mixed blessing at best. The side effects from those medications were difficult to deal with: nausea, sleeplessness and a lack of energy. There was no easy solution, and the answer was still a few years away."

So how did San Francisco come to be the medical-marijuana capital of the world? Enter Dennis Peron. One of the earliest baby boomers, he was born in New York City at the end of World War II.



DAN SKYE, KENT SEA



Denis Peron

that he was using the seized pot for medicinal purposes. The judge threw out all the charges and denounced the arresting officers. Sadly, West passed away one week later.

West's death served as an inspiration for Peron's fight. He co-authored 1991's Proposition P, the San Francisco Medical Marijuana Initiative, which passed with a staggering 79 percent of the vote. Prop. P wasn't a law, but rather a resolution declaring that the city of San Francisco officially endorsed medical marijuana. Buoyed by this victory, in 1994 Peron opened the first public medical-marijuana dispensary in America: the Cannabis Buyers Club on Church Street in the Castro. (AIDS activist Thomas O'Malley actually established the first "private" med-pot collective at that same Church Street location in 1990.)

Eventually, Peron moved the club to a more high-profile Market Street location in downtown San Francisco, where it was raided and often became the subject of headlines and controversies throughout the '90s. Meanwhile, the California legislature approved several medical-marijuana bills, but they were all eventually vetoed by then-Governor Pete Wilson.

Defiant as always, Peron sought to legitimize medical marijuana by making it legal via a statewide ballot initiative. On November 5, 1996, Proposition 215 passed with 56 percent of the vote, finally legalizing medical marijuana in California.

The late, great "Brownie Mary" must be recognized in this struggle as well. She wasn't a gay-rights activist in the traditional sense, but she certainly felt a kinship with the outsider status accorded gays. Mary Rathburn began supplementing her income in the late 1970s by selling pot-laced brownies. She was busted in 1981 by the SFPD. Ironically, the community service required by her sentence directly led Rathburn to her med-pot activism: She volunteered with the pioneering Shanti Project, the first public AIDS support group, and began sharing her brownies with the HIV/AIDS patients at the famously compassionate Ward 5-A in San Francisco General Hospital.



The late Brownie Mary.

Brownie Mary was arrested two more times, but the subsequent media coverage only served to increase and legitimize the status of medical marijuana in the culture at large, leading the city to officially declare "Brownie Mary Day" on August 25, 1992—one more example of San Francisco's support for medical marijuana long before Prop. 215 was enacted.

The "munchies" actually helped combat AIDS wasting syndrome.

Following Prop. 215's passage, the source of conflict for many gay-rights activists shifted from the local police to the federal government, which vehemently opposed legalized medical marijuana in California. Raids on clinics and cultivators, orchestrated by the DEA during Bill Clinton's last term and George W. Bush's presidency, were all too common. But the climate changed considerably when Barack Obama took office in 2009 and stated that the federal government would no longer target dispensaries operating in accordance with state medical-marijuana laws, thus allowing med-pot to thrive as never before. Coupled with the reduction in AIDS deaths, the gay-rights movement has shifted its focus to the issue of gay marriage, a much bigger topic of conversation in San Francisco now that medical marijuana has been widely accepted, both legally and socially.

But the work is far from done. In August 2010, Dennis Peron's Castro Castle, a pot-friendly inn, was raided by the SFPD. A dozen people were arrested, including Peron, who had suffered a stroke a few months earlier. The next day, all 12 were released, and no charges have been filed—yet. The motivation for the raid is still in question, though some speculation has centered on the lingering SFPD resentment towards Peron. It's a reminder that gays in San Francisco and throughout the nation will have to continue their struggle for equal rights, whether it's the freedom to use medical marijuana or the freedom to live as we choose. ✨

Peron's story is similar to many of his countercultural counterparts: He got drafted, served in Vietnam (in Peron's case, in the Air Force) and discovered that marijuana provided a welcome escape.

Peron was openly gay before it was socially acceptable. In time, he was drawn from the East Coast to San Francisco and soon started dealing weed out of his apartment in the Castro, in what he dubbed the "Big Top Pot Supermarket." His audaciousness was an affront to the San Francisco Police Department: In 1978, the cops raided his Castro pad and shot Peron in the process. It was the first of more than a dozen raids on the "Big Top." Peron was eventually convicted, serving two years in prison.

Then, in the mid-'80s, Peron's lover, Jonathan West, was diagnosed as HIV-positive. The two found that cannabis was effective in helping West deal with the side effects of this deadly virus. The appetite-stimulating phenomenon known as "the munchies" actually helped combat AIDS wasting syndrome. Mutual friends suffering from HIV/AIDS also reported that their quality of life was improved by using pot. As Justmann recalls: "Being the caring and loving individual Dennis is, he started providing cannabis to friends of his over his kitchen table."

Peron's crusade to legalize medical marijuana began with a 1990 bust, when 10 plainclothes narcs raided and ransacked his pad, forcing the extremely ill West onto the floor, where one officer put a foot on his neck and mocked: "Know what AIDS means? Asshole In Deep Shit." West, now down to 85 pounds and covered with Kaposi's lesions, testified at the subsequent trial



MARKET ANALYSIS

Kush once again landed in the top pot spot as the month's most submitted strain; however, its average price was down \$52 from last month. Diesel, which placed second, balanced things out by jumping \$54 in average price from last month. Cheese made the top five for the second straight month after making its debut in February, while White Widow made the list for the first time in nearly a year (April 2010). The top five submitted strains (with average price) were Kush (\$348), Diesel (\$393), Haze (\$392), White Widow (\$370) and Cheese (\$339).

Index Watch: All indices finished above their previous month's average with the exception of the Kind Index, which came in \$21 below its February average.

HIGH TIMES wants to know what you're smoking. Submit your strain information, including location and price by the ounce, to thmq@hightimes.com.

Trans-High Market Quotations (THMQ) reports pot prices by the ounce, strain and location. To submit prices, go to the THMQ link at hightimes.com.

CURRENT US PRICE INDEX: **\$335** (last month: \$335; YTD: \$356)

CURRENT KIND INDEX (\$350+ PER OZ): **\$405** (\$426, \$418)

CURRENT MIDS INDEX (\$150-\$349 PER OZ): **\$275** (\$268, \$275)

CURRENT SCHWAG INDEX (\$1-\$149 PER OZ): **\$130** (\$109, \$120)

Big Bud - \$300

Sacramento, CALIFORNIA

"Drops lots of trichomes onto my rolling tray and features a somewhat sweet, purply taste, which, while good, isn't as tasty as some Green Crack I scored a couple months ago."

Purple Kush - \$400

Melbourne, FLORIDA

"Very dense, sticky, stinky, frosty buds that taste like Fruity Pebbles and have a rank, sweet funk you can't hide. Some buds aren't entirely purple, while others are so dark they almost look black."

California Outdoor - \$250

Louisa, KENTUCKY

"This bud is special—light green, covered in orange hairs and looking like it was dipped in sugar. Plus it has a great fruity taste."

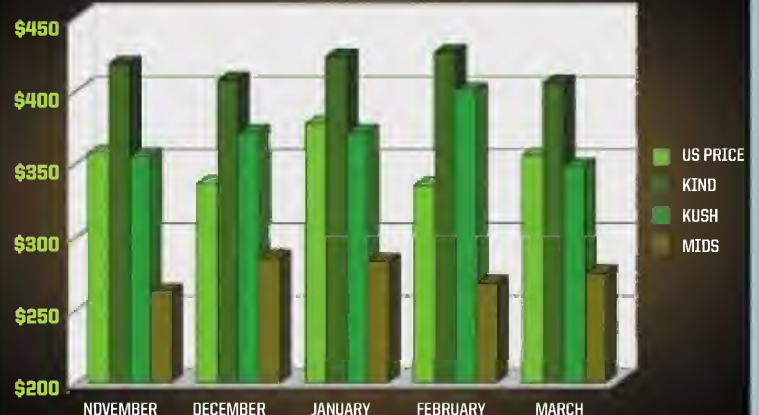
Super Silver Haze - £260

Manchester, ENGLAND

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ARKANSAS	Paron	OG Kush	\$300
CALIFORNIA	Sacramento San Diego San Francisco	Big Bud Grape Ape OG Kush Headband	\$300 \$360 \$360 \$360
COLORADO	Denver	Super Lemon Haze Sour Diesel Sour Kush	\$350 \$300 \$325
CONNECTICUT	Greenwich	Sour Diesel	\$475
DISTRICT OF COLUMBIA	Washington	Blue Dream White Widow	\$375 \$300
FLORIDA	Melbourne Orlando	Purple Kush Chiesel	\$400 \$350
HAWAII	Big Island Honolulu	White Widow Bubba Kush Grape Ape Super Silver Haze	\$350 \$375 \$450 \$425
ILLINOIS	Chicago	Apollo 13	\$400
KENTUCKY	Louisa	Northern Lights California Outdoor	\$200 \$250
MAINE	Portland	Whiteberry	\$400
MASSACHUSETTS	Brockton	Outdoor Blueberry Jack Herer Haze	\$225 \$425 \$500
MICHIGAN	Houghton Lake	Bubba Kush LSD	\$375 \$400
MONTANA	Missoula Stockett	Trainwreck Cheese LA Confidential	\$250 \$300 \$300
NEBRASKA	Gordon	Hawaiian Snow Sour Diesel White Widow	\$480 \$500 \$450
NEW JERSEY	Atco Indian Mills	Vanilla Kush Jack the Ripper	\$400 \$450
NEW YORK	New York	Kush Diesel Juicy Fruit	\$375 \$365 \$320
OKLAHOMA	Tulsa	Silver Haze C-99	\$300 \$400
PENNSYLVANIA	Pittsburgh	Super Silver Haze Blue Dream	\$375 \$375
RHODE ISLAND	Providence	Chocolate Chunk Strawberry Cough	\$350 \$380
TEXAS	Lubbock	LA Confidential	\$500
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WASHINGTON	Seattle	Blue Cheese Kush	\$280 \$280
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LO-FI IS THE NEW HIGH

Typically, jam-prone '70s bands or riff-friendly metal groups have provided the soundtrack to many a bonged-out evening. But recently, a swath of easygoing indie-rock kids have been using the herb for inspiration, hatching out collections of fuzzy, reverby songs that often evoke lazy times at the beach. Here are some of the best ones to smoke to. By Nisha Gopalan



THE YOUNG

Who: Hans Zimmerman (vocals, guitar), Ryan Maloney (drums), Kyle Edwards (guitar), Jason "Jug" Costanzo (vocals, bass)

Where: Austin

What: The members of this scuzzy garage-punk band assure us they're stoners, even if their song titles—"Phoebis Cluster," "Quintana the Killer," "Half Moon Burning"—suggest they're taking peyote out in the desert
Check Out: Their debut album, *Voyagers of Legend*

Your album title sounds very Hobbit-y. Are you *Lord of the Rings*/fantasy stoners?

HANS [laughing]: It's a reference to pre-Columbian societies in North America. Sometimes you don't have to move your body to have a voyage.

JUG: I would put us closer to *Back to the Future*.

It's hard enough to Google your band name ... how do I do that baked?

JUG: Turn off the computer and go outside. Google is boring. Go to nature!

If you could smoke out with anyone in history, whom would you smoke with?

KYLE: Carl Sagan—but only if we got to smoke out of his stash. We'd go hang out at an observatory and look at stars all night, and I'd make him tell me the secrets of the universe.

HANS: I wouldn't smoke with anyone, but I would *smoke* [Thin Lizzy's] Phil Lynott!

What's your go-to Scooby Snack?

RYAN: Taco Window till the day I die ... FTW!



BEST COAST

Who: Bethany Cosentino (vocals, guitar)

Where: Los Angeles

What: "Sun Was High (So Was I)" was, fittingly, her breakout track, setting the tone for the rest of her work: ambling summer tunes inspired by the Beach Boys and the Shangri-Las

Check Out: Her debut album, *Crazy for You*

What do you like to listen to when you're stoned?

BETHANY: A lot of rap. Yesterday, I took the photos for HIGH TIMES and smoked *so much*—and I listened to all of this Drake stuff I had in my computer. I feel like you can just hear everything so much better when you're high.

You recently collaborated with Kid Cudi. I'm guessing you smoked with him.

BETHANY: Cudi had a guy who was rolling blunts; it was nuts. [Comedian] Katt Williams has this really funny story about when he smoked with Snoop Dogg: He would pass a blunt to someone, and a second later another one would get passed to him. That's sort of what it was like in the studio.

Having toured a fair bit, where would you say the best weed is?

BETHANY: California. But sometimes dispensaries are really scary. That's why I was bummed that the one I go to closed. Now I have to get reacquainted with a new place. There's one in Eagle Rock that's comic-book-themed. It's really dorky and cool in there.



THE BITTERS

Who: Aerin Fogel (vocals) and Ben Cook (guitar)

Where: Toronto

What: A miasma of post-punk and surf rock, with hard-lunged vocalist Fogel channeling the pipes of X's Exene Cervenka on cuts like "Travelin' Girl"

Check Out: Their debut album, *East General*

Describe the first time you ever smoked weed.

BEN: It was grade seven, just before the first big dance of the year. I had promised to dance with this chick, Janelle, for the entire dance. We slow-danced to Boyz II Men. I had never kissed a girl before, and I ended up French-kissing her during "I'll Make Love to You"—to this day, one of my favorite songs ever. No joke.

How many of your songs are actually about pot?

AERIN: None. Deal with it.

What would you consider the high point of your musical career so far?

BEN: I'd say when I was on a tour with Ghostface Killah some years back [with his hardcore band Fucked Up]. I ended up on his bus a couple of times listening to old soul music, and all these Staten Island dudes and Ghost were passing me blunts. You know that point of being really high where you're socially anxious and just want to run to the bathroom and poo out of nervousness? Yeah, that was one of those times.

People always rhapsodize about Vancouver herb. Being from Toronto, does that annoy you?

AERIN: Not at all. Vancouver grows some wicked weed, and Toronto doesn't. Some people get really into different strands—my brother exclusively smokes Kush out of a vaporizer. But I'm not that precious about it.



WAVVES

Who: Nathan Williams (vocals, guitar), Stephen Pope (bass), Billy Hayes (drums)

Where: San Diego

What: Skater-boy/frontman Williams has refined his penchant for spinning attention-span-addled ditties (like the stoner-comedown anthem "Weed Demon") into full-blown sing-alongs

Check Out: Their third album, *King of the Beach*

How do you procure weed on the road?

NATHAN: We have it in our rider, so it's normally pretty easy. But Sweden is hard. They're strict!

This release is not as sonically muddled as your last one—does that make

it less of a stoner album?

NATHAN: It's way *more* of a stoner album! My favorite thing to listen to when I'm stoned is melody, so there's just a lot more melody on this record. And I'm always stoned while we record.

You famously had a meltdown onstage last year in Spain. Did you smoke too much?

NATHAN: I don't even remember if I smoked weed that day, but I got too fucked up. It really surprised me that it got the press that it did. I took it hard maybe the first day or two, then I realized it really didn't matter. It's people being haters ... it is what it is.



CROCODILES

Who: Brandon Welchez (vocals) and Charles Rowell (guitar, keyboards)

Where: San Diego

What: The duo specializes in Jesus and Mary Chain melodies with '60s keyboards. Slow jams like "Girl in Black" will make you think you're levitating

Check Out: Their second album, *Sleep Forever*

Describe your first time smoking weed.

CHARLES: I was living on the island of Terceira, off the Portuguese shore; my father was in the Navy. There were many bull-runnings in the streets. At one, my friend offered me a drag. Seconds later, we were running for our lives, attempting to escape this massive beast barreling down the road.

If you could smoke out with anyone in history, whom would you smoke with?

BRANDON: I'd probably choose someone funny like Richard Pryor—as long as he didn't try to get me to freebase with him.

Your debut has songs like "I Wanna Kill" and "Summer of Hate." Your new album has songs called "Hollow Hollow Eyes" and "All My Hate and My Hexes Are for You." Are you paranoid stoners?

BRANDON: We did get held up at gunpoint last year after smoking, and that experience definitely tripped me out a little

CHARLES: We've had several brushes with the law, so it's safe to say that I'm paranoid whenever I'm not within a three-block radius of my apartment.

What's your preferred method of smoking?

CHARLES: Joints, joints, joints—I love the skill that's involved. I pass the time by perfecting my rolling. ✨

'I'm definitely a Sour Diesel, Granddaddy Purp and Jack Herer fan, but I also like regular weed. I'm older ... there's days I have things to do and wanna feel coherent.'



Blunt talk with Black Sheep's Dres.

BLACK SHEEP'S SUBTERRANEAN HOMESICK RAP

A veteran rapper shows that being gangsta isn't all it's cracked up to be. By John Fortunato

Once riding high atop the rap charts with their classic '91 joint "The Choice Is Yours," Black Sheep survived in the underground hip-hop periphery for years thereafter. A belated entry into the famed Native Tongue collective, Black Sheep's urban warfare dug deeper than its competitive alliance ever dared, parodying gangsta rappers as "low-life vomit-tasting pee-drinking ho-slap-ping" family murderers on their astounding debut, *A Wolf in Sheep's Clothing*.

The brainchild of Queens MC Andres "Dres" Titus and beat-making pal William "Mr. Lawnge" McLean, who'd first met as teens in North Carolina, Black Sheep got their big break when renowned DJ Red Alert aligned them with Native Tongue masterminds like A Tribe Called Quest, De la Soul and the Jungle Brothers. But first, Dres had to do a stint at Rikers Island for marijuana and cocaine distribution.

"I thought it was my birthright to hustle, and got locked up for selling weed and coke. Essentially, I did one year in jail, then bumped into Lawnge, who'd come up from Carolina to make music," Dres recalls.

Unlike all those hardcore rappers boasting 'bout bitches, money and crime, however, his prison sentence gave Dres a different perspective. "Hardcore rappers peddled their flaws—I thought it'd take more character to talk about the possibilities available when you come from the place I did," he reasons. "I wanted people to relate."

Since his parents had sung vocals in several unheralded bands, Dres was encouraged to perfect his rhyming skills and create some formative tapes. He had also begun smoking weed, sneaking hits from joints even before his family settled at the military quarters in Fort Bragg. Then, at the still-tender age of 14, he came to the harsh realization that his mother was dealing.

As Dres tells it: "One day my mom's calling me frantically at the officers' headquarters. I said, 'What's wrong?' She threw my jacket on me, pulled out a pillow of weed, stuffed it up my shirt and ushered me toward the front. As she opens the door, the military police are coming into our house. She pushes me past them and yells, 'Tell your mother I'll call her in an hour!' I had no idea what was going on until I left. I've got a half-pound

bag of weed ... so I sat down with a friend and got blasted."

Though still green, the pre-incarceration Dres was being steeped in the old soul and rock music that would inform his Native Tongues recordings. But after the first Black Sheep album brought them worldwide acclaim, Mr. Lawnge assumed a lesser role for their equally fine follow-up, *Non-Fiction*. Suffering from promotional problems, Dres eventually retreated to the underground sans his former partner.

Due to the violent deaths of Tupac Shakur and the Notorious BIG, Dres dismissed hardcore rap's gangsta lyricism. His derogative stance provided the antithesis to gang-related terrorist tactics. He also vowed never to get reincarcerated. As Dres recalls: "I'd wish I was butt-naked in Times Square in the cold of winter when I was in that jail cell—at least I'd have an opportunity to get clothes and maybe find a job instead of being trapped. That kept me focused."

As the smoke cleared and rap's ghetto wars died down, Dres came back strong with a few solo albums, then used the Black Sheep moniker for 2010's ambitious *From the Black Pool of Genius*, securing his status alongside the antecedent sages of R&B. Moreover, a KIA car commercial featuring dressed-up, road-bound hamsters used "The Choice Is Yours" as a promotional hook.

The ad gave Black Sheep a boost for *Pool of Genius*. Bringing his ripened viewpoints to the table, Dres laid down his most penetrating instructional rhymes yet. Yet despite all the mentored wisdom and caustic narratives, he still finds time for "puffing the vapor" on tracks like "Important Fact," which snubs the money grubbers among us.

"I used to find skunk in Harlem years ago," Dres says. "I'm definitely a Sour Diesel, Granddaddy Purp and Jack Herer fan, but I also like regular weed. I'm older ... there's days I have things to do and wanna feel coherent."

Before he takes off, the ex-offending rap master offers a final thought regarding marijuana distribution and the legalities thereof: "It's imperative to legalize marijuana. It's a shame anyone's locked up for weed—horrific." 🌿

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'I can't remember when I made a beat without smoking. I always have a joint burning down slowly. When it starts burning my fingers, I'll light another one—a few more burns, a few more bars. That's how the tracks are made.'

Rusko enjoys the sunshine and sinsemilla of his adopted city, Los Angeles.

CHRONIC DUBSTEP

Rusko rides a wave of sensi smoke to success. By Justin Hampton

Hate to say it, scenesters, but the secret's out—dubstep's going big. Rihanna and T.I. have already taken a hit of the bass-heavy, slow-paced grooves developed out of South London, and now even Britney Spears is trying it on for size on her new LP. Behind the boards of each of these high-end forays into dance music's Next Big Groove is the 25-year-old Christopher Mercer, a.k.a. Rusko, a scruffy ska-punk refugee who nowadays serves as dubstep's ambassador to the mainstream from his base in Los Angeles. Starting out in 2005 after hearing the sound played at a club in his native Leeds, Rusko constructed anthems like "Cockney Thug" and "Jahova" and gained access into Major Lazer member Diplo's Mad Decent camp through his lighthearted and accessible approach to the occasionally taciturn musical style. "When I first released my first few dubby, synthy kind of bright-and-happy tunes, the rest of dubstep was all dark and moody," he recalls. "And so from the time I released my very first record, I split people half and half, and got as many haters from [it]. But now a lot of people are doing similar things, [which is] really cool."

Whatever his disputes with dubstep purists may be, Rusko embraces the weed lifestyle as passionately as any of them ever could—all you have to do is look at the cover of his latest LP, "*O.M.G.!*" (Mad Decent). He hardly appears concerned about the cop car routinely stationed in front of the high school across from his house as he burns down joint after joint during the course of our interview. That and massive amounts of soda and Hawaiian Punch apparently sustain him through much of his production process. "I can't remember when I made a beat without smoking," he asserts. "I always have a joint burning down slowly. When it starts burning my fingers, I'll light another

one—a few more burns, a few more bars. That's how the tracks are made."

No doubt, weed, alongside career opportunities and the weather, brought Rusko to California. He's found reliable sources in London, but can also tell you horror stories about "gritweed"—the UK term for schwag coated with flour, Coca-Cola and even fiberglass to add bulk and give an attractive sheen to substandard buds. In addition, he's soured considerably on Amsterdam over the years, flat-out declaring his adopted home state the winner of the competition. "You can't touch the Cali buds, seriously," he insists. "People [in England] go to Amsterdam and spend a bunch of money. I'm just like, 'Dude, it's colder than London, and it's 5000 expensive. For the price you pay there, just seriously go to LA. It's like 90 degrees and the weed is 10 times better.'" He's even found his favorite British strain, UK Cheese, in a Venice dispensary, so he's got all the comforts of home nowadays.

2010's been a good year for Rusko. Big-ticket production gigs for artists like Britney and his good buddy MIA have kept him busy, and "*O.M.G.!*" shows him diversifying his sound and working with Crookers and Gucci Mane. And, fingers crossed, maybe Meatloaf will be next, as Rusko has already reached out to his management about it. It's clearly dubstep's day, and Rusko plans to take full advantage of it. "I could make ten simple bass-line bangers a day and play them to fans who will cheer and sing along the words, but that's not really a challenge," he reminds the haters. "Making a track for Britney that's still hard and heavy enough that I can play it in the clubs but yet they're also playing it on the radio all across the world, that's a challenge! And I'm a musician. I wanna get back to being a musician, and that's much more of a musical outlet for me." ✨

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Autoflowering

A feminised automatic strain of high stature. We have selected this particular one, which can reach a height of 1-1,5 metres, in order to answer our customers demand for a taller automatic strain. Good production of compact and resinous buds. A fruity taste with a Skunk touch.

(Big Devil)

Autoflowering: 100%. Indoor Blooming: 6 weeks.
Indoor/Outdoor Harvest: 9 weeks from the germination. Height: 1-1,5 m.
3s. 25€ / 5s. 42€ / 10s. 84€



Autoflowering

Our most recent and fastest autoflowering strain. Excellent production with big buds covered by abundant and aromatic resins. These plants can reach heights of 40-90 cm. Strong effect and sweet taste with exotic tones inherited from its Diesel ancestry.

Fast Bud

Autoflowering: 100%. Indoor blooming: 5 weeks.
Indoor/Outdoor Harvest: 7 and half weeks from germination. Height: 40-90 cm.
3s. 18,50€ / 5s. 32,50€ / 10s. 65€



Autoflowering

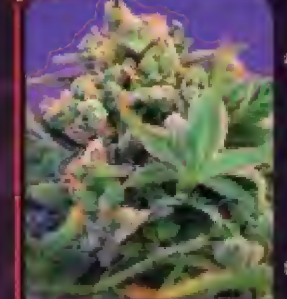
Automatic feminised variety. The beginning of its flowering does not depend on season or photoperiod; therefore it can be grown all year round. Extremely fast flowering, it's height does not exceed 80 cm. Sweet aroma, hints of cheese and yeast.

Speed Devil

Autoflowering: 100%. Indoor Blooming: 5 weeks.
Indoor/Outdoor Harvest: 8 weeks from the germination. Height: 40-80 cm.
3s. 24€ / 5s. 40€ / 10s. 80€

Sweet Cheese

New



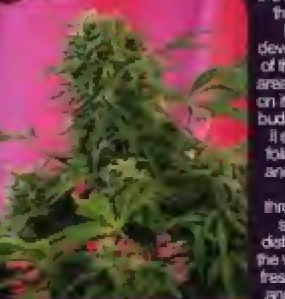
It's a fusion between two high-grade strains, Cheese x Black Jack. The genetics highlight the virtues of its ancestors, giving a new twist to the aromas and flavour of the Black Jack. It produces long central buds surrounded by plenty of peripheral buds that are also long and of good quality. Its high productivity added to a new and revolutionary flavour - a slight taste of mature cheese and spice - makes Sweet Cheese a recommended option for those who seek new flavours and aromas. Regarding the effects, it is important to remember that we're dealing with a mix of two of the big hitters in cannabis genetics. Its effect is strong and long lasting, inducing euphoria and a feeling of relaxation.

Indica/Sativa: 30%-70%.
Indoor Blooming: 8 weeks.
Outdoor Harvest: Mid-late October.

3 seeds 29,70€ / 5 seeds 48,60€ / 10 seeds 90€

Snow-Fruit

New



Sweet Seeds present the abominable plant of the snow! It has predominantly indica genetics that, in our opinion, have rarely been seen before. This strain has an exaggerated development of the lateral branches. Because of this just one plant can occupy an extensive area of cultivation and produce a huge harvest on its own. It produces succulent and compact buds thanks to its long calyxes. While it blooms it exhibits a charming range of colours in its foliage, with shades of green, magenta, red, and purple. It also develops a big mantle of trichomes in the flowering bunch and throughout its foliage during this phase. It's a strong strain, with a very short internodal distance and strong stalks that help it to resist the windy conditions of outdoor growing. While fresh, its aroma is reminiscent of a mix of mint and fruits of the forest, with a slight flavour of toasted almonds and humus. Its effects are very strong and relaxing due to its high percentage of THC and CBD. This is a strain of high medicinal quality.

Indica/Sativa: 97%-17%.
Indoor Blooming: 8 weeks.
Outdoor Harvest: End of September.

3 seeds 24,90€ / 5 seeds 41,50€ / 10 seeds 83€

Double-White

New



This is the result of crossing two elite clones selected around the year 2000, White Widow and Great White Shark, which are the two most appreciated and famous of the White family. Genetics characteristics include easy growth, strong effect, extraordinary taste and high production of trichome covered buds. In short, this is a plant with which it is easy to get good results. It's a vigorous and strong plant, with short internodes and a very resistant structure. This allows easy control of its growth during which the blooming of the buds join together to form a long tail. Its aroma is very pleasant and powerful, with slight tastes of sweet and sour, fresh and floral. The effect is also strong and typical of the indica-sativa hybrids.

Indica/Sativa: 60%-40%.
Indoor Blooming: 9 weeks.
Outdoor Harvest: Mid-late October.

3 seeds 18,60€ / 5 seeds 32,50€ / 10 seeds 65€

Cream Caramel



Cocktail of our best indicas, Blue Black x Maple Leaf Indica x White Rhino. Sweet and caramelized taste. Relaxing and antidepressant.



Indica/Sativa: 90%-10%.
Indoor Blooming: 8-9 weeks.
Outdoor Harvest: End of September, beginning of October.
3s. 24€ / 5s. 40€ / 10s. 80€

3 seeds 29,70€ / 5 seeds 48,60€ / 10 seeds 90€

S.A.D. S-1



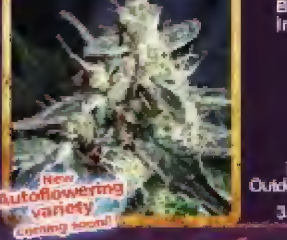
Self-pollination of one of our strongest and most aromatic mothers. Afghan genetic, with a strong sweet aroma.



Indica/Sativa: 90%-10%.
Indoor Blooming: 8-9 weeks.
Outdoor Harvest: End of September.
3s. 18,50€ / 5s. 30,50€ / 10s. 61€

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Black-Jack



One of our most powerful and productive hybrids, Black Damina x Jack Herer. Intense incensed Haze aroma. Very strong hybrid.



Indica/Sativa: 50%-50%.
Indoor Blooming: 9 weeks.
Outdoor Harvest: Beginning of October.
3s. 19,50€ / 5s. 32,50€ / 10s. 65€

3 seeds 18,60€ / 5 seeds 32,50€ / 10 seeds 65€

Jack 47



Hybrid between the two most powerful varieties of all time, Jack Herer x AK 47. Very high production with a very intense effect. Excellent force, the plant produces big buds full of resins. Sweet and incensed aroma.

Indica/Sativa: 25%-75%.
Indoor Blooming: 9 and a half weeks.
Outdoor Harvest: End of October.

3s. 30€ / 5s. 56€ / 10s. 110€

Ice Cool

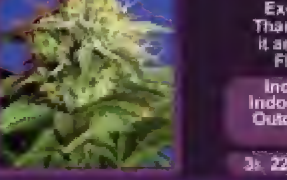


Developed starting from a NYC Diesel line, powerful with high production with a particular and strong blue cypress tone and exotic smell. Indica's plant structure with a strong euphoric effect that shows the presence of sativa in its genetic heritage.

Indica/Sativa: 40%-60%.
Indoor Blooming: 9 weeks.
Outdoor Harvest: End of September.

3s. 29,30€ / 5s. 48,80€ / 10s. 97,50€

Green Poison



Hybrid variety principally indica with very high production. Excellent taste and aroma. Thanks to its quick flowering, it anticipates fungal attacks. Flowery and fruity taste.

Indica/Sativa: 70%-30%.
Indoor Blooming: 7 weeks.
Outdoor Harvest: Mid to late September.

3s. 22,60€ / 5s. 37,50€ / 10s. 75€

Sweet Tai

Súper Tai x Early Skunk
Indica/Sativa: 30%-70%.
Indoor Blooming: 9 weeks.
Outdoor Harvest: End of September, Beginning of October.
3s. 17,50€ / 5s. 29€ / 10s. 58€

Wild Rose

Rosetta Stone x HOG
Indica/Sativa: 35%-65%.
Indoor Blooming: 9 weeks.
Outdoor Harvest: Mid to late of October.
3s. 21€ / 5s. 35€ / 10s. 70€

Mohan Ram

White Widow x S.A.D. S1
Indica/Sativa: 85%-15%.
Indoor Blooming: 8 weeks.
Outdoor Harvest: End of September.
3s. 20€ / 5s. 33€ / 10s. 66€

Psicodelicia

U.S.A Clone x Nepal's Plant
Indica/Sativa: 30%-70%.
Indoor Blooming: 8-9 weeks.
Outdoor Harvest: End of September, Beginning of October.
3s. 19,50€ / 5s. 32,50€ / 10s. 65€

Ganesh Spirit

Sativa clone from Northern India's mountains
Indica/Sativa: 40%-60%.
Indoor Blooming: 8 weeks.
Outdoor Harvest: Beginning-mid October.
3s. 21€ / 5s. 35€ / 10s. 70€

Flash Back #2

FLO x White Widow
Indica/Sativa: 40%-60%.
Indoor Blooming: 8-9 weeks.
Outdoor Harvest: End of September, Beginning of October.
3s. 19,50€ / 5s. 32,50€ / 10s. 65€

Collector Edition Pack

C.Pack #1
6 seeds properly labeled
S.A.D - Black Jack
Psicodelicia
38€

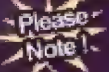
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Sweet Tai
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INSIDE THE OCTOPUS

The Last Circle

Cheri Seymour

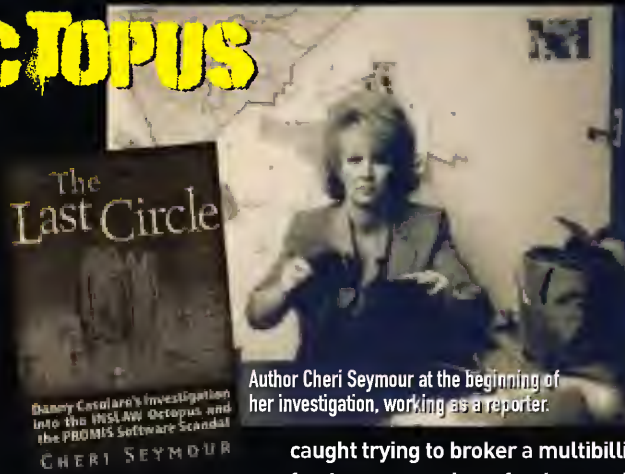
(Trine Day)



Danny Casolaro was found dead in Martinsburg, WV, on August 10, 1991. He was the first journalist to investigate the links connecting many of the most notorious political crimes of our century, from JFK to Watergate to the October Surprise to the cocaine-trafficking contras. Casolaro stumbled into this incredible black hole of evil deeds after researching the theft of a software program named Promis, which had been developed for the Justice Department to track criminal cases. Among other things, Casolaro probably discovered that the software was being used by the National Security Agency (NSA) to launder illegal drug profits. It was also sold to foreign governments with a secret backdoor for covert use by our intelligence agencies.

Cheri Seymour has spent many years tracking the trail of evidence that Casolaro left behind, and the results have finally been published in *The Last Circle*. For those who think "conspiracy theories" are merely crackpot ideas entertained by the tinfoil-hat brigade, this book is a stunning eye-opener.

After Casolaro became convinced that many of the same criminals



Author Cheri Seymour at the beginning of her investigation, working as a reporter.

were involved in the most notorious political-corruption cases of the last 30 years, he began referring to them as "The Octopus"—and all of the various tentacles seemed to lead directly into the NSA. It was a controversial theory, but Seymour has done an admirable job separating truth from fiction. She was even able to get access to Robert Booth Nichols, Casolaro's main source of information as well as his primary target. Nichols reportedly died last year in Switzerland after being

caught trying to broker a multibillion-dollar gold certificate to a hedge-fund manager whose fund was going under water. (Apparently, drug profits are often disguised as "gold" when moved into the banking system.)

Those who have studied the history of the Federal Reserve (and its connections to the Bank of England) will not be surprised to find a distinctly British connection to this story: Even as Nichols freelanced for the NSA, the Gambino crime family and the Japanese yakuza, among others, he was reportedly being supervised by England's MI6, according to one insider. As Seymour's book amply demonstrates, Casolaro deserves a place in history alongside Marine Corps Major General Smedley Butler, who also tried to blow the whistle on corruption in the highest places, only to have his career and reputation destroyed. Read this book and tell your friends about it.—Steven Hager

Monster Magnet

Mastermind

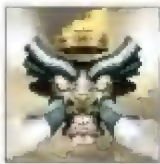
(Napalm Records)



"I don't want to rape the world today," Dave Wyndorf sings in the chorus of the rumbling fire-starter "Bored with Sorcery"—but the Monster Magnet frontman is perfectly comfortable burying it beneath a throttling shit storm of fuzzed-out guitar on the band's best album since 1998's breakthrough *Powertrip*. Oscillating between feral garage-psych throwdowns and a deep-rutted throb that tips its hat to stoner rock's doom-metal acolytes, Monster Magnet have fashioned a truly dynamic disc with enough flavor to satisfy the full breadth of their following.

Mastermind features expansive, slower-paced, darkly hued space jams ("The Titan Who Cried Like a Baby"), moody balladeering ("Time Machine"), monolithic, reverberating riffage that grooves like it's dragging a 10-ton anchor (opener "Hallucination Bomb"), greasy Southern-rock-inspired flammability ("Gods and Punks"), and even an unusually tuneful closing track riding a modish hook ("All Outta Nothin'"). The diversity prevents the album from bogging down in its resin-ated sonic plumage, even though nearly every track pushes the five-minute mark or beyond.

As always, Wyndorf—a self-described "punked-out freak on a Big Wheel ... crossing a frontier of lies"—presides over the festivities with a carnival barker's mix of swagger and pomposity that ranges from sly wit to campy excess, like a well-blunted David Lee Roth. The highlight is "Dig That Hole," a paean to the modern age, whose steely opening riff slowly blooms to a rattling roar as Wyndorf declares, "This is all about me!" It's the kind of delectable, synapse-blasting slice of irreverence that characterizes Monster Magnet at their best, the cherry atop their thick fudge sundae of sound.—Chris Parker



Buddy Guy

Living Proof

(Silvertone/Jive)



When Buddy Guy claims to be "74 years young" on the opening cut of his new album, he's not joking. While his peers are playing out the string of their revered careers, Guy keeps adding to his legend. His latest is a furious blast of blues prowess showcasing his still-feral licks and a voice as crisp and strong as most artists half his age. It's at least as good as 2001's *Sweet Tea*, the critically acclaimed disc that helped revitalize his career.

Guy's playing is so gritty and noisy that it's easy to imagine him throwing off sparks while he mines enough fury to make indie rockers like Sonic Youth blush. But he's more than a great guitarist; he's a fine songwriter as well. The album opens with four sterling tracks: the aforementioned "74 Years Young," a powerful, mud-caked walking-blues ode to his youthful ambitions; "Thank Me Someday," which recalls how Buddy kept his family "up all night, and now they're thanking me everyday"; the horn-abetted "On the Road," which channels a funky smoothness reminiscent of Robert Cray before closing in a rugged tangle of guitar; and "Stay a Little Longer," an easygoing gospel tune that closes out the string, featuring B.B. King and Buddy trading compliments and licks like two old porch-picking buddies.

Living Proof loses some steam in the middle, but regains momentum with the spooky, organ-driven "Where the Blues Begins" (with a guest turn by Carlos Santana), the rag-inflected stomp "Too Soon," and arguably the album's finest track, the invigorating kiss-off "Let the Door Knob Hit Ya (Where the Dog Shoulda Bit Ya)." —Chris Parker



Fishers of Men: The Gospel of an Ayahuasca Vision Quest

Adam Elenbaas

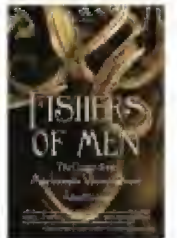
(Tarcher)



"I'm a butterfly. Everything is fine," Adam Elenbaas says while heaving into a toilet. And so goes his ayahuasca-infused jungle romp of a memoir, *Fishers of Men: The Gospel of an Ayahuasca Vision Quest*. Whether vomiting into toilets or the more sacred vessels known as Peruvian purge buckets, Elenbaas spins a cathartic tale, masterfully guiding his readers through a series of spiritual quests that he undertook in the attempt to break through the chrysalis of his childhood hurts and fears.

Engaging throughout and pregnant with the author's imagination, *Fishers of Men* starts off with a riveting snapshot: Elenbaas on the bathroom floor of his family's parsonage, bleeding from self-inflicted wounds and eyes fluttering, his stress-addled father by his side. "I imagined all of the times I had heard my father, a Methodist minister, preach Sunday morning sermons from the pulpit," Elenbaas recounts. "I imagined the entire church congregation sitting on that bathroom floor, right there with me, hushed ... everybody listening carefully, everybody witnessing my father's best sermon to date." Then, in mere pages, we blast off from that bathroom floor to find ourselves with the author in the Peruvian forest, gearing up for his first experience with the sacred, highly psychedelic vine *ayahuasca*.

Unflinchingly honest, with a healthy dose of self-examination and graciously few preachy parts, *Fishers of Men* is an important book that will prove especially fascinating to anyone who has ever had their curiosity piqued by the thought of an *ayahuasca* ceremony.—Mary Ought Six



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A LEGACY OF INTEGRITY

Author, activist and marijuana martyr Peter McWilliams inspired millions. By Paul Krassner

It's the 10th anniversary of Peter McWilliams's death, and although I don't believe in an afterlife, his legacy as a prolific author serves as one. Countless readers of his work continue to be awakened and influenced by his insights and activism. With empathy and wit, Peter contributed so much to help close the gap between the value systems of mainstream society and the counterculture.

For those of us who knew him, the loss had an extra dimension. He was a generous friend, gifting me in 1984 with my first computer. In turn, my anthology, *Pot Stories for the Soul*, published by HIGH TIMES, began: "This book is dedicated to Peter McWilliams, whose creative and compassionate leadership in the medical-marijuana movement has continued to be inspiring and invigorating." He was proud that the collection was the winner of the Firecracker Alternative Book Award and also became a Quality Paperback Book Club selection. When attorneys for the authors of *Chicken Soup for the Soul* sent me a "cease and desist" letter warning about the title, I recall his uproarious laughter when I observed: "Even though theologians and scientists alike don't know where the soul resides, it can be copyrighted."

My wife Nancy and I used to drive up to Peter's home at the top of a hill in Los Angeles, then order Chinese food and watch *The Daily Show with Jon Stewart* on his gigantic TV screen. We attended his courtroom appearances and perceived the way ambitious, puritanical prosecutors were prone to use him as a stepping stone to advance their own careers.

At an anti-prohibition rally on the lawn of the Federal Building in Los Angeles, I introduced him to Dennis Peron, who became the co-author of Proposition 215, the Compassionate Use Act of 1996, the now-famous California law legalizing cannabis for medical use. Peter suffered from AIDS and cancer. "Something that a lot of people don't realize," he told me, "is that when you smoke marijuana regularly—several times a day—it loses its euphoric effect. The medical benefits continue—relief of



The late Peter McWilliams

'Puritanical prosecutors were prone to use him as a stepping stone to advance their careers.'

nausea, pain [physical or emotional], spasticity, excessive eye pressure [glaucoma] and so on—but the euphoric effects go away. While I was using marijuana to treat my nausea, I can't tell you how much I missed getting high.

"Although I'd smoke it several times a day, the average high-school student was getting high more times a month than I was. That's because after the first month, I never got high—and I really enjoy marijuana's high. Simply put, recreational marijuana you use to get high; medical marijuana you use to get by."

During the last year of his life, we began collaborating on a screenplay about cyber war, his concept for a movie that turned out to be strikingly prescient [as indicated by the recently published book, *Cyber War: The Next Threat to National Security and What to Do About It* by Richard Clarke, former special advisor to the president on cyber security].

After Peter got arrested—and was forced to stop taking his medicine—he hoped to be sentenced to home detention with an ankle bracelet for electronic monitoring, while simultaneously trying to prepare for a possible five years' incarceration in federal prison. Two months before he was due for sentencing, he was found dead in his bathtub. He had died from asphyxiation, choking to death on his own vomit.

I told this to Ken Kesey, who—with his uncanny ability to cross-fertilize compassion with irreverence—responded: "Well, I would rather choke on my own vomit than on somebody else's."

That year, at the National Libertarian Party convention—where presidential candidate Harry Browne came out firmly for the decriminalization of marijuana—Peter was the posthumous winner of the party's Champion of Liberty Award. He remains in my life as a touchstone of integrity and a practitioner of enthusiasm. ✦

Ironically, science-fiction writer Harlan Ellison wrote an anti-marijuana introduction to Pot Stories for the Soul, available at paulkrassner.com.



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Now residing in Brooklyn, IB has released her fourth free mixtape to great success. The mixtape was officially released in December 2010, complete with a limited edition double cover designed exclusively by myMovement artist-in-residence Logic14. With a live five-piece backing band and artist Logic14 painting live, her shows are a unique experience. IB has a superb lyrical forte, witty one-liners, and an edgy, yet feminine delivery. She is a force to be reckoned with in hip-hop and quite simply the hottest unsigned hip-hop artist that the world has yet to hear.

For more on IB, including tour dates and free audio samples, check out hightimes.com/IB.

MISS MARCH

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BY BOBBY BLACK

**THAT SPACE
CADET GLOW**



Roger Waters in the flesh.

I was just six years old when Pink Floyd released their dark, double-vinyl magnum opus, *The Wall*—far too young to understand its subtle, psychological nuances and neuroses, or to attend the band's legendary live performance at Nassau Coliseum. It wasn't until many years later, after watching the film while tripping balls on some particularly pure and potent LSD, that I came to understand its profound genius, and to lament—as I have so many times—about being born a decade or so too late.

So when I heard Q104.3 FM's Ken Dashow announce that Roger Waters would be taking his existential rock epic back on the road for his final tour, I vowed not to miss it. Being the burnout that I am, however, I forgot and

procrastinated until, before I knew it, the now sold-out show had arrived at Madison Square Garden. With \$17 in my checking account, there was no way on earth short of giving hand jobs out behind the Garden that I was getting in.

But luckily, buying tickets wasn't the only thing I'd spaced on: I'd also forgotten that this guy Tony I met a few years back in Austin had mentioned at this year's Doobie Awards that he might be working the crew on Roger Waters's next tour. Well, he was—and, thankfully, Tony didn't forget about *me*. Mere hours before the show, I got the following message:

"Hey, Bobby ... it's Tony. My boss just handed me two tickets for tonight. Not the best seats, but they're yours if you want 'em."

I was so pumped that I literally ran to the Garden to meet him. The tickets ended up being on the side of the stage toward the back, right on the dividing line between the band and the audience. From my seat, I could see into both worlds; perceptually speaking, *I was the Wall*. Granted, this made seeing the cool shit being projected on the Wall nearly impossible, but so what? *I was there*. And when the plane came swooping down from

the top of the arena and crashing into the Wall at the end of the first song, "In The Flesh?", the

ensuing explosion was practically in my lap. Which, by the way, was Tony's handiwork; turns out he wasn't just some roadie—he was on the pyro squad.

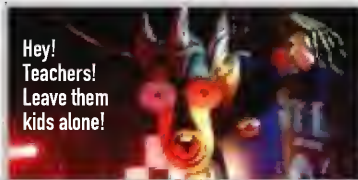
Before I even had a chance to light up, an equally elated fellow Floydian sitting alone behind me passed down half a joint. When I tried to hand it back to him, he just shook his head. "*Duuude ...*" he said, gesturing toward me with his hands. "Enjoy."

Two weeks later, when the tour returned to the Izod Center, Tony called again with more tickets. I grabbed my buddy Nico and a medicated Bliss bar (Wayward Bill) and headed for Jersey. This time, our seats were first level, center stage, right behind the soundboard—about as perfect a view as anyone could ask.

With its menagerie of flying pigs, giant puppets, projections and pyrotechnics, *The Wall* is one of the most ambitious and elaborate stage shows ever conceived. Waters's powerful pro-peace propaganda turns the imagery of fascism back onto itself to visually attack authority, capitalism, war and oppression. As the bricks in the Wall began to stack up, they were filled with the faces of those ravaged by war (past and present), spray-painted slogans and iconic animations from the film (including those nefarious marching hammers).

By intermission, the 35-foot white wall separating us and them was complete. During the second half, small openings allowed us a glimpse into the madness lurking behind it as the band gradually, song by song, joined us on the other side. Perhaps I was a bit too comfortably numb, but when the trench-coated Waters sang, "There's one smoking a joint!", I could've sworn he pointed right at me.

Sadly, the rumors of David Gilmour making an unannounced cameo proved to be unfounded. Nevertheless, it was an amazing performance. *The Wall* hasn't only stood the test of time, it's grown more meaningful to me with age. Seeing it live was a once ... okay, *twice ...* in-a-lifetime experience. ✨



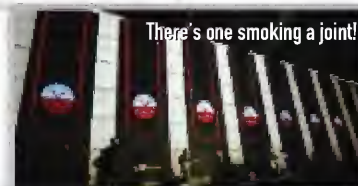
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Hammers on the march.



There's one smoking a joint!



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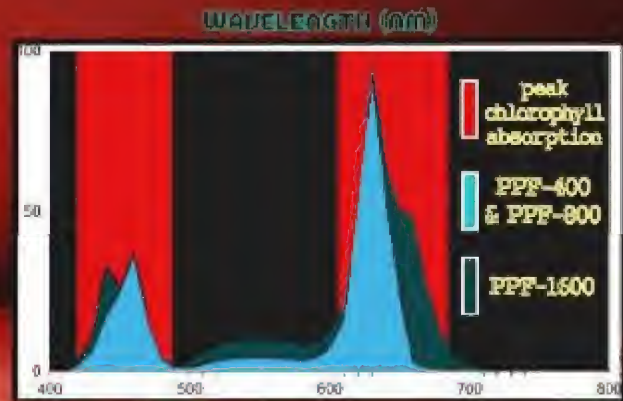
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The harvest in California was epic, as always, and the marketplace is now flooded with product. However, along with this year's pot crops, the seeds of discontent were also sown: The price of outdoor pot is plummeting, and growers are getting anxious. **Story & photos by Dan Skye**

OUTDOOR ODYSSEY

"I'm trying to get out of it 100 percent," one Northern Cali grower tells me. "I don't wanna do it—I just don't see any future in it at all. I don't think I could take care of my family.

"Still," this grower adds, "it's so hard not to put out an outdoor crop, because it pretty much takes care of itself."

It's a warm October day up in Trinity County. This is outdoor-cultivation country: rugged and remote, but teeming with activity as the harvest season begins. This particular grower is taking a break. He's hired a crew of three to help build a sturdy grow house in one corner of the 40 acres of Trinity wilderness he owns. Just a couple of hundred yards away from the construction site, his garden is standing tall, a picturesque patch of OG Kush glistening in the sun. He looks over at it and just shakes his head.

"Man, when I first started out, I used to get \$3,000 in the Bay Area," he says wistfully. "That was eight years ago, so we're talking about a one-third drop in price. Mom and pop? Fuckin' *everybody's* doing it ... whole families are growing! It just seems that the number of outdoor grows triples every year. It went from one neighbor's yard to three neighbors' yards to five neighbors' yards to the whole street—every single place. It's just mass production."

Welcome to the not-so-Golden State—at least when it comes to the outdoor marijuana market. Twenty-five years ago, growers could count on getting \$5,000 or more per pound.



An outdoor grower uses a saw to harvest a monster plant



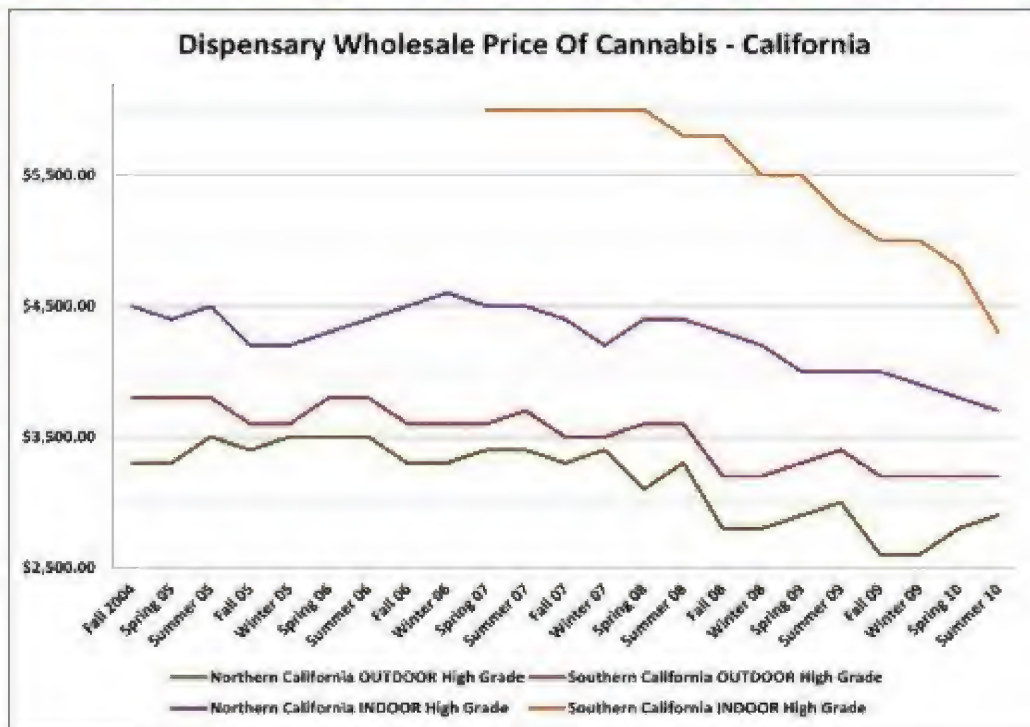
A Mendocino County garden awaits the reaper.



David Lampach predicted a precipitous drop in prices for 2010 outdoor crops.

But with the introduction of liberal medical-marijuana laws and the influx of thousands of new growers arriving to take financial advantage, the California cannabis industry is getting schooled on the laws of supply and demand. Even top growers—those with reputations for high-quality pot earned over years of growing—have seen their prices fall below \$2,500 per pound. Often, they'll settle for \$2,000. New growers without connections can expect half of that—or even less.

In October, David Lampach, a co-owner and researcher at Oakland's Steep Hill Lab, the top cannabis-testing facility in the US, forecast even more gloomy news for California's outdoor growers. After the north coast was subjected to an unseasonably early heavy rainstorm in September, Lampach noted: "Early rains have a significant impact on the outdoor market. Expect higher incidences of mold contamination in the



cannabis supply from this region. In addition, flower coloration is impacted by the increased moisture and cold temperatures that accompany a weather event of this magnitude. The low- and mid-grade outdoor markets, which were already poised to experience significant challenges this fall, will be even more hard-pressed to recover from the crash-level price declines experienced over the last several years. Many buds that might have otherwise ranked as high-grade outdoor

will slip into the middle and low grades. The bottom has fallen out for the low-grade market, and further price declines should be expected."

The glut of outdoor pot and consequent price drop has more than a few growers contemplating the idea of focusing on indoor only. This "crisis" is amplified by the fact that medical-marijuana dispensaries have lately demonstrated a strong preference for indoor product, giving credence to the myth that indoor pot is somehow superior to outdoor.



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Has the marketplace become over-saturated with outdoor buds?

'The margins are higher for outdoor pot elsewhere because, the further you travel away from California, the less critical the eye is.'



Erich Pearson of San Francisco's SPARC dispensary.

Erich Pearson, who runs the SPARC (San Francisco Patient and Resource Center) dispensary in San Francisco, is critical. "Dispensaries have not been educating the public," he opines. "People are beginning to believe that indoor cannabis has a higher THC content. But the genetics of a plant remain the same whether it's grown indoors or outdoors. We've grown the same seeds indoors and outdoors, and the THC level has remained the same. In fact, our outdoor Black Domina comes in at 18 percent, while

our highest indoor product, an OG Kush, comes in at 16.5.

"People have not been told about the environmental benefits of growing outdoors. Dispensaries seem to prefer indoor because it's a prettier product; outdoor pot is duller, not as glossy. But it's not like outdoor pot is dirtier or even moldier. Steep Hill Labs, whom we rely on to test our products, states that there is no difference in mold content."

Coupled with the stronger market for indoor pot is the huge outdoor harvest statewide. Veteran growers commonly store their crops for sale in the spring and summer months, after the outdoor market has become less saturated. But these days, many Left Coast growers don't have that option. Our nation's financial meltdown has been especially cruel to California residents, who live in a state that is literally bankrupt. Jobs are scarce and money is tight, and countless cash-strapped Californians have gotten into gardening as a means of seeking some financial relief. Unfortunately, many growers can't wait for better

prices: They need cash for basic living expenses—mortgages, car payments, groceries—and they need it now! Consequently, prices in recent years have been doing a nosedive come autumn—sometimes down to a mere \$700 per pound.

At the same time, while California's outdoor harvest may have been enormous, it's essential to note that the vast majority of these crops are shipped outside the state. "It affects the price of outdoor pot here," an dispensary owner in LA points out. "The margins are higher for outdoor pot elsewhere because, the further you travel away from California, the less critical the eye is. Outside the state, the differences between indoor and outdoor aren't that significant—provided that the product is decent outdoor, the margins remain high for outdoor pot sold out of state. As the outdoor pot dries up, dispensaries are forced to buy indoor pot all summer long. So when the outdoor season arrives, they're looking to make up for lost margins by taking advantage of the glut of outdoor product."

A NorCal grower who's sold product to dispensaries for years reports: "Everybody just wants us to leave samples. If you had indoor, they'd take it right then." But with outdoor, he says, it's "Not today, we'll call you back."

This grower adds: "Even down in Southern California, it's gotten tough. Fresno and Bakersfield, the farmlands, they're bringing in tons of outdoor. There's a lot being grown in the foothills. People are coming in with suitcases full of outdoor. Get this: I know a grower who just sold a 10-pack of Snowcap [10 pounds] for \$15,000. It was pretty decent stuff, and he only got \$1,500 a pound—and he had to deliver it! Times have changed."

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Given this situation, who could possibly blame outdoor growers (with the obvious exception of law enforcement) for selling their crops out of state? Guerrilla growers in NorCal say that prices haven't changed in years, with their product fetching anywhere from \$3,500 to \$4,500 per pound. However, wherever pounds are being sold, it's usually the middleman making the most money. The downward pressure has been solely at the wholesale level—and, sadly, the consumer doesn't appear to benefit.

"The middleman is what screwed California pricing," says B.E. Smith, a NorCal veteran with 30 years of cultivation under his belt. "We used to be real paranoid—you had the same buyer for years. Then, all of a sudden, legal medical pot came in, and the buyers could start buying it from other people cheaper. Remember, whoever buys it for \$800 from the growers is still going to get a good price for it. So outdoor pot hasn't 'failed'—I mean, do they have a survey on all the guerrilla growers and how much they're getting selling it outside the state?"

Smith includes California's dispensaries in that "middleman" category: "If there's been this huge drop in prices, how come it's not being passed on to the consumer?"

To be fair, the overhead for growing indoor crops is far higher than an outdoor garden. But Smith isn't buying it.

"Years ago, I said that we should be able to grow pot for \$500 a pound. And I would still grow \$500 a pound—if I could get the dispensaries to promise that there would only be a certain amount of markup. There's nothing compassionate about some of them bastards ... not a damn thing. They're preying on patients," he says flatly.

But while many complain of the precipitous drop in outdoor prices, others merely shrug.

"Even if it goes down to \$1,000 a pound, it's still worth it, isn't it?" says a Mendocino County grower. "A friend of mine figured out that if he was getting \$60 an ounce, it would still be better than



'The middleman is what screwed pricing. Whoever buys it for \$800 from the growers is still going to get a good price for it.'

going and doing construction. Hell, you bring in a hundred pounds, even after your overhead for trimmers and such, it's still worth it."

Some growers see a whole new danger lurking down the road. "If the Central Valley farmers ever get involved, we're out of business," says one in Humboldt County. "I mean, they got the irrigation systems already from the vegetables they grow; they're ready to go. What does it take to put clones in instead of tomatoes? A bunch of five-

pound plants just rowed up like corn? It's scaring the shit out of me!"

Even so, some growers are far more sanguine. "There's going to be a 'weeding out' in the industry, if you will—or, to make another pun, a shake-out," says one of the more optimistic farmers I talked to. "And it will be *good* for the industry."

In fact, David Lampach of Steep Hill Lab believes that in the future, the entire industry will move to greenhouses. "At what point is it not economically feasible to grow indoors?" he asks. "Can it compete—especially when people come to understand that greenhouses produce terrific plants?"

And if new standards for quality (and quality control) add a new degree of legitimacy to the industry, then the best growers will certainly benefit—which means the consumer will benefit as well. Though these costs will inevitably be passed on to the consumer, the new product should not only be better, but also dependably, *consistently* better.

And at this point, although growers say they've experienced downward pressure on prices for the last 10 years, quality is what's being lost in the equation. A successful Mendocino grower reminds everyone that "pot isn't all the same"—which may seem obvious to most readers of HIGH TIMES, but let's hear it one more time.

"It's like bad wine compared to fine wine," this grower says. "So when we talk about things that go for \$700 a pound—sure, out there, and I've even heard \$600—but what is that? We have neighbors that are very basic people: They're not [professional] growers, but they grow bud. And the variation in quality is *huge*."

"That's the bottom line. It's like buying anything else—you can buy crummy-grade apples or number ones, the ones you want. But the issue of indoor versus outdoor? It doesn't matter where it's produced or what it is; the consumer is the final judge of quality and price. So if you have a competitive product, you'll do fine." ✨

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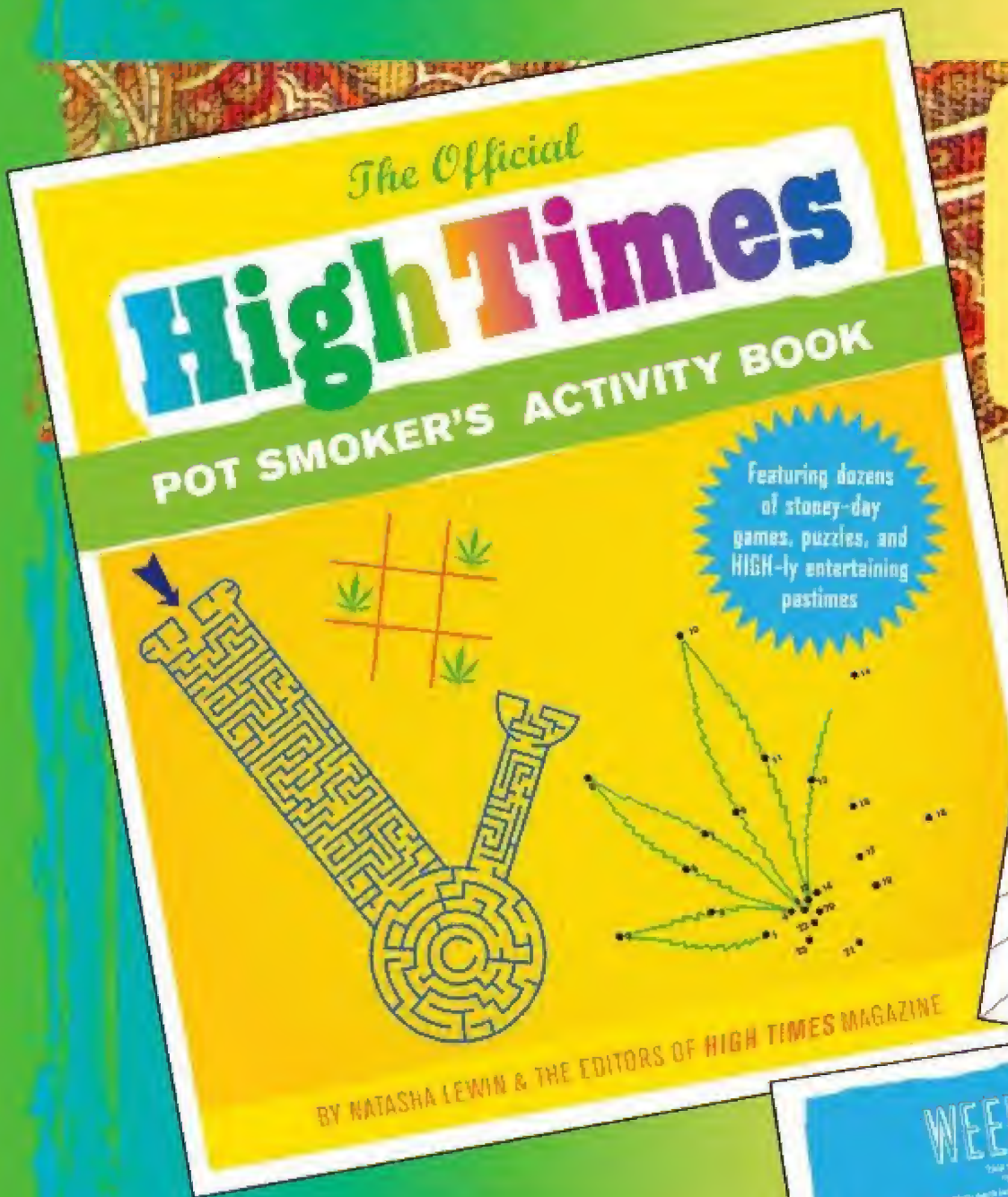
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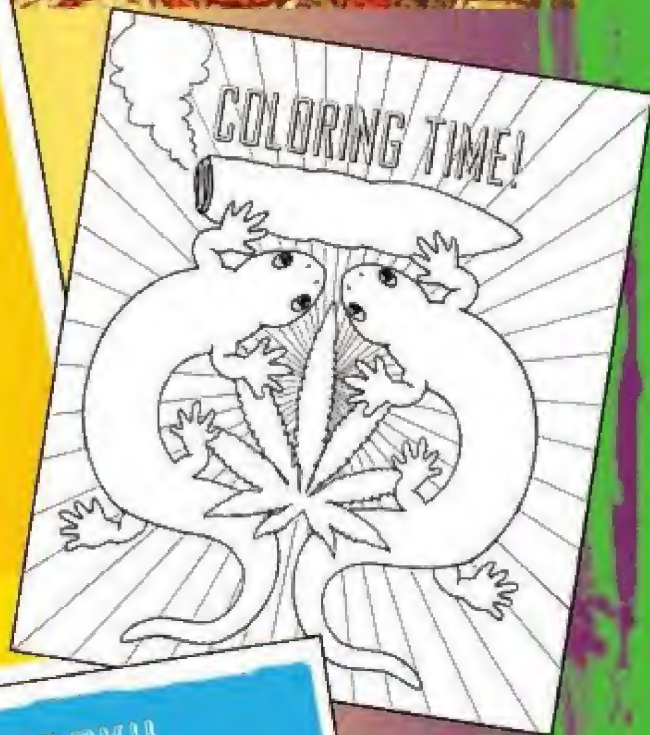


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STEPPING STONED

How Prop. 19 lifted the tide of reform nationwide and pushed marijuana legalization in California one step closer to inevitability. By David Bienenstock

Richard Lee, primary backer of California's historic Proposition 19 ballot initiative, didn't make an appearance on the night of November 2, at least not in front of the news cameras and hopeful crowds gathered outside the three-story, 30,000-square-foot main campus of Oakland University, his flagship operation in downtown Oakland. But back in 2006, when *HIGH TIMES* presented Lee with our Freedom Fighter of the Year Award, he did make a brief, ironic and perhaps highly prophetic acceptance speech.

"I've got good news and bad news," Lee began. "Good news: Cannabis will no longer be illegal in 2013. Bad news: According to the Mayan calendar, the world will end in December 2012. Thank you."

In that spirit, here's the bad news, which you no doubt already know: After the smoke cleared on Election Night, marijuana was no more legal in the Golden State than when the day began. And now for the good news: Prop. 19 supporters actually have a lot to celebrate. For starters, there's already serious talk at the highest levels of the marijuana-law reform movement about another legalization push in the next election cycle—and not just in California; Nevada, Washington, and Massachusetts could also get in on the action. Best of all, if any of those efforts earns a majority, then marijuana will indeed be legal for at least 45 days before the Mayan calendar ends on December 21, 2012.

In slightly more practical terms, despite being outspent \$160 million to less than \$5 million, the Regulate, Control and Tax Cannabis Act received far more votes than Republican gubernatorial candidate and former eBay CEO Meg Whitman, without the endorsement of any statewide candidate from either major party—clear proof that pot legalization has matured into a mainstream political issue despite the ingrained opposition of the Washington establishment.

In total, 3.6 million Californians pulled the lever for Prop. 19, an impressive 45 percent of the electorate. Many others supported legalization in theory, but voted against the initiative after succumbing to doubts carefully sown by law-enforcement groups all the way up to US Attorney General Eric Holder, whose own version of an "October Surprise" arrived just two weeks before the election, when he vowed that the Justice Department would "vigorously enforce" federal laws against marijuana if Prop. 19 passed.

Holder's threat came after nine former heads



Clockwise from right: Oakland founder Richard Lee; legalizers had high hopes on Election Night; inside Prop 19 headquarters during the final push

of the DEA publicly chided the Obama administration for not speaking out more forcefully on the issue, and was clearly timed to give momentum to trend lines that were already pushing the initiative below 50 percent approval as Election Day approached. Meanwhile, legalization's usual self-interested opponents teed off on their typical litany of bullshit: Employers wouldn't be able to ban pot on the job (wrong), regulated sales would increase underage use (wrong), legalized cannabis would cause crime (wrong), marijuana would be a gateway to hard drugs (wrong), and on (wrong) and on (wrong).

It's tempting to think of the voters who switched in those crucial final weeks of the campaign as "middle of the road," when in reality they're just ambivalent legalizers who proved susceptible to scare tactics and fear of the unknown. But what seemed like a new and

frightening leap of faith this year may feel like common sense two years down the road—especially if, between now and then, our side keeps loudly and proudly making the case that America's War on Marijuana is a 75-year disaster, and that the best way to keep kids away from pot, save taxpayer money, create jobs, fight the Mexican cartels, and support our local communities is by legalizing a plant that's far less harmful than alcohol.

By initiating an unprecedented debate about marijuana legalization in the media, Prop. 19 has made that job incalculably easier. And not just in California, already home to the nation's most progressive cannabis laws, but across the country and even around the world. In fact, Prop. 19 was a major topic of debate in Mexico, where the cartels make up to 40 percent of their profits by exporting black-market mar-

ijuana to the US, and employ horrific violence to maintain their illicit market share.

"How great it would be for California to set this example," former Mexican President Vicente Fox commented on a radio program. "I pray to God that it passes."

Fox made his plea to a higher power, but it was Richard Lee who got the ball rolling on Prop. 19, kicking in \$1.4 million of his own money to spearhead the effort, including gathering the nearly 700,000 signatures required to put the initiative on the ballot. Now officially the most high-profile marijuana entrepreneur in America, Lee is the founding father of the nine-block stretch of Broadway in Oakland known to pot smokers worldwide as Oaksterdam, the home not just of his successful marijuana university,

movement would rally around him.

In a press conference held the day after the election, Drug Policy Alliance executive director Ethan Nadelmann made the case that Lee had been right all along. "I was among those who initially tried to discourage Richard from going forward," Nadelmann admitted. "I called Richard a couple of weeks ago to say, 'Win or lose, you were right. Even if we don't prevail, the transformation in public dialogue—not just in California, but nationally and internationally—has been nothing short of stupendous.'"

Nadelmann was instrumental in securing a \$1 million donation to Prop. 19 from billionaire philanthropist George Soros, which arrived with just weeks left in the campaign. Other

Despite being outspent \$160 million to less than \$5 million, Prop 19 received far more votes than Republican gubernatorial candidate Meg Whitman, without the endorsement of any statewide candidate from either major party.

but also two coffeeshops, a medical-marijuana dispensary, a gift shop, a student union and his political headquarters—all of which have helped transform the area from a scene of urban blight into a "green oasis" of commercial viability and community support.

Lee first proposed running a legalization initiative at the 2008 NORML Conference in San Francisco, where he cited polls showing strong support in California and sought backing from the gathered leaders of the marijuana-law reform movement. But many of them felt that 2012 held greater promise for victory and urged Lee to wait. Instead, the ir-repressible pot impresario decided to push on almost single-handedly in hopes that the

large donors included marijuana-law reform mainstays Peter Lewis, George Zimmer and David Bronner, plus contributions from Facebook co-founders Dustin Moskovitz and Sean Parker, two billionaires under 30 who will hopefully continue to support the cause long into the future.

But in the end, it all added up to considerably less cash on hand than what most experts would recommend for a statewide campaign in support of a controversial proposition. Still, Prop. 19's very respectable showing at the polls, despite being clearly underfunded, should get major donors thinking that with better financial and logistical support—and two more years to make the case

to an increasingly receptive electorate—this issue could be a big winner. In fact, some high-level strategists in the Democratic Party have reportedly been investigating marijuana initiatives as a potential "wedge issue" capable of raising youth turnout, with a corresponding benefit for Democratic candidates.

If marijuana-law reform's major activist organizations do come together for another try in 2012, they'll benefit mightily from the experience gained by the campaign staff and dedicated volunteers who worked tirelessly for more than a year on Prop. 19. Students for Sensible Drug Policy, which has chapters on more than 150 college campuses, joined the effort in full force at every level, from the organization's national leaders to its grassroots activists. SSDP members in California registered voters and campaigned on and off campus, while out-of-state chapters organized phone-banking pizza parties to call eligible voters and explain the benefits of legalized cannabis.

And all of this effort paid off: Exit polls showed that youth turnout was up 16 percent over 2006, the last midterm election in California, and that a whopping 64 percent of those under 25 supported Prop 19. Unfortunately, voters in non-presidential elections tend to skew much older in general, and the initiative was strongly opposed by those over 65, with 68 percent voting no. To address this disparity, NORML has just announced the formation of a Senior Alliance to help get the word out about the medical benefits of marijuana to older Americans, as well as educate them about the danger that marijuana prohibition poses to their loved ones and to the country. In the meantime, perhaps the first phone-banking call that all college-age activists make in 2012 should be to Grandma and Grandpa. ✨

ELECTION RESULTS

This November, marijuana made the ballot in four states, with voter initiatives in Arizona, South Dakota and Oregon seeking to create or expand safe access to medical marijuana, while citizens in California decided the fate of Prop. 19, designed to legalize the possession and use of cannabis for all adults over 21. With California's historic campaign driving the discussion, and the state's battered economy necessitating a search for new sources of tax revenue and green jobs, marijuana—medical or otherwise—suddenly became a hot topic in the media.

For the first time, we had the beginnings of a rational and reality-based discussion about the wisdom (or complete lack thereof) of our prohibitionist approach to cannabis, along with record-high polling of support nationwide for both medicinal cannabis and recreational adult use. But the only poll that really matters is the one held on Election Day, and three of four statewide marijuana ballot initiatives fell short of victory on a night when Republican politicians brought out huge numbers to vote. Only Arizona passed, and by a margin so thin it took more than a week to confirm the results.

Disappointment is a natural reaction to defeat, but determination will serve us far better. You can help get the marijuana momentum rolling back towards reform by joining forces with Americans for Safe Access (safeaccessnow.org), the National Organization for the Reform of Marijuana Laws (norml.org), Students for Sensible Drug Policy (ssdp.org) and other activists near you!

CALIFORNIA

Proposition 19

YES: 46% NO: 54%

Prop. 19 would have legalized possession of one ounce of marijuana for all adults over 21, including limited self-cultivation, while allowing cities and counties to approve sales and distribution through local control ordinances.

Yeson19.com

OREGON

Measure 74

YES: 42% NO: 58%

Oregon has already approved medical marijuana for patients with a doctor's recommendation. Measure 74 would have created a system in which licensed cultivators grow and distribute cannabis to the state's medical-marijuana dispensaries.

Measure74.com

SOUTH DAKOTA

Measure 13

YES: 37% NO: 63%

Measure 13 called for the legalization of medical marijuana for those with a doctor's recommendation. Patients and/or their caregivers would have been allowed to possess up to six plants and one ounce of marijuana at a time.

Sdcompassion.org

ARIZONA

Proposition 203

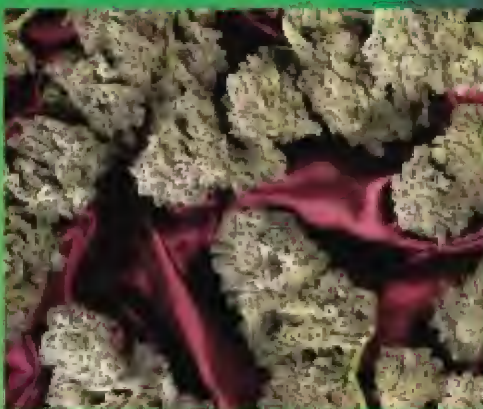
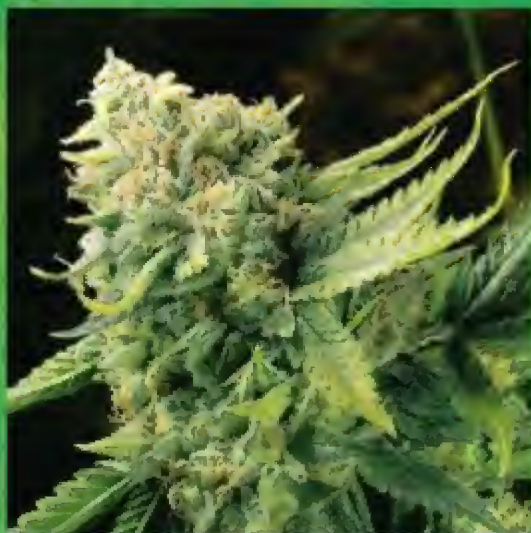
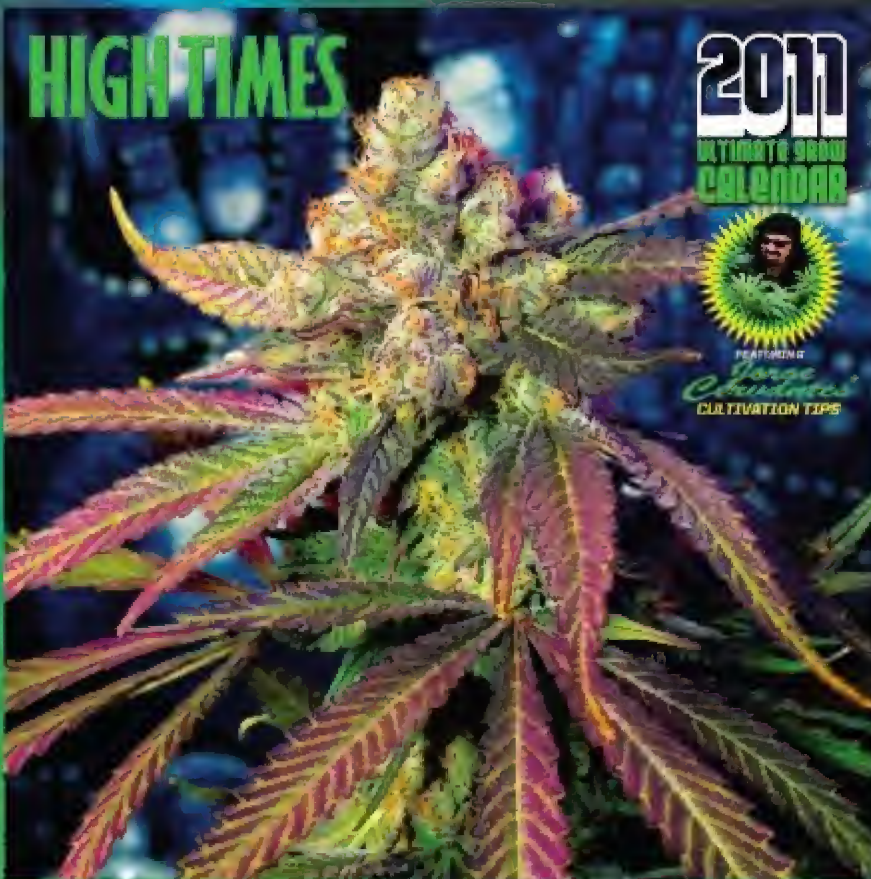
YES: 50.1% NO: 49.9%

Arizona voters have already passed medical-marijuana initiatives twice, in 1996 and 1998. Unfortunately, due to a technical error in the wording of these laws, they have failed to effectively protect medical-marijuana patients from arrest. Proposition 203 will close this loophole and protect patients.

Stoparrestingpatients.org

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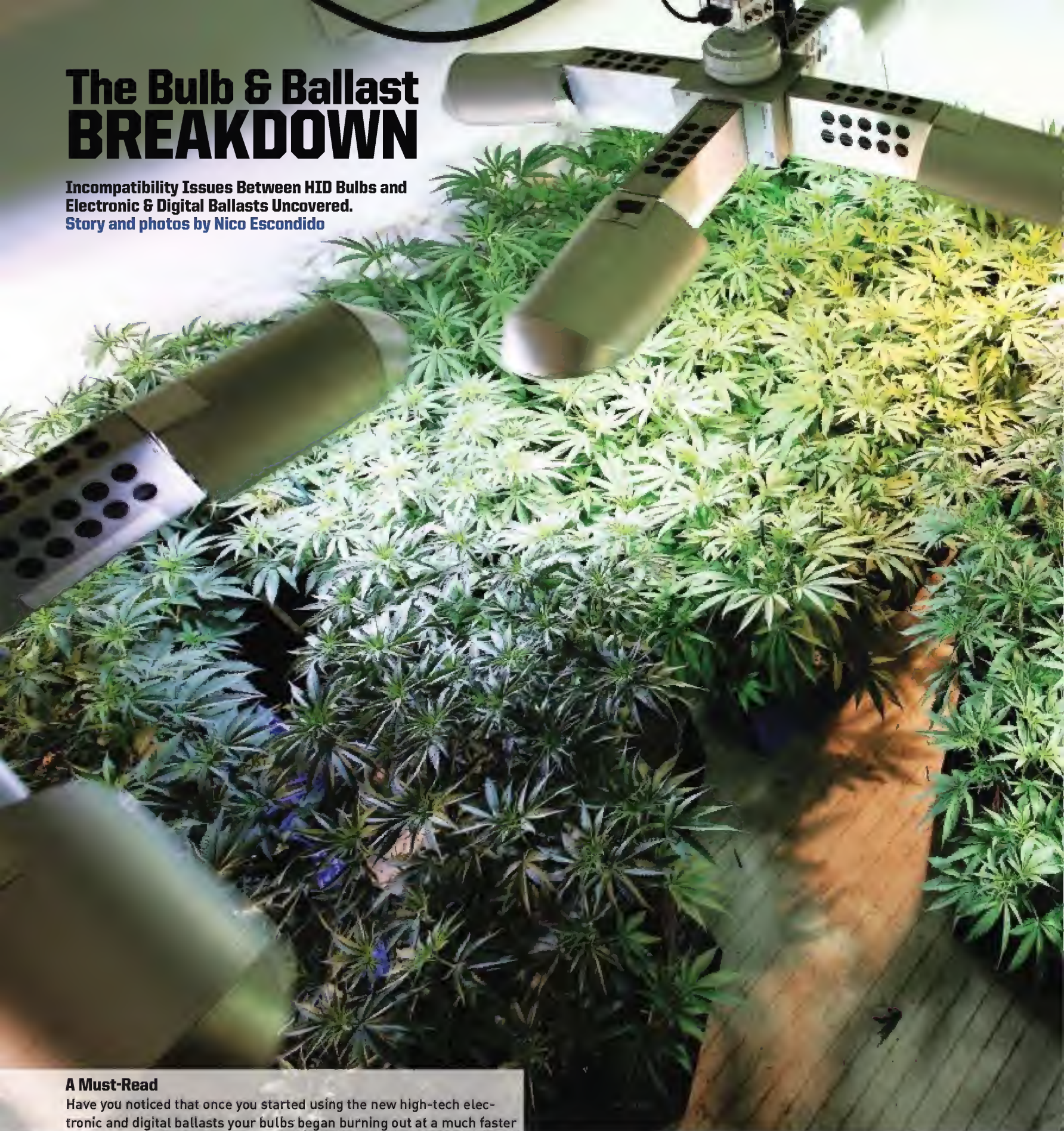
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The Bulb & Ballast BREAKDOWN

Incompatibility Issues Between HID Bulbs and Electronic & Digital Ballasts Uncovered.
Story and photos by Nico Escondido



A Must-Read

Have you noticed that once you started using the new high-tech electronic and digital ballasts your bulbs began burning out at a much faster rate? Well, you're not alone. The rumors are flying and, unfortunately, they are true. Depending on who you ask, however, the blame can be placed on either one of the two industries, though it is more likely that both the ballast and bulb industries are equally responsible for the problem.

The problem is, in a nutshell, today's new electronic and digital ballasts are not compatible with the standard metal halide (MH) and high-pressure sodium (HPS) bulbs that growers have become accustomed to using over the past 30 years. And what it all boils down to in the end is simply a lack of communication between the manufacturers of our high-intensity discharge (HID) bulbs here in North America and their counterparts manufacturing the ballasts overseas in countries such as China.

About Ballasts, About Bulbs

Before we get into the actual problems between HID bulbs and electronic and digital ballasts, let's first familiarize ourselves with the various types of bulbs and ballasts that come into play when dealing with indoor grow facilities. For starters, the predominant bulb types that we deal with in indoor growrooms are fairly standard and have changed very little over the past few decades. HPS, MH and fluorescent lightbulbs dominate the marketplace because they provide either optimal spectrum or light intensity (power), or both, to drive plant growth.

Fluorescent bulbs are the weakest of the trio, but are known for their broad spectrum. They also are softer in intensity and run cool, making them



In the growroom new technology can be both a blessing and a curse, but like anything else, knowing is half the battle.

excellent choices for seedling and clone nurseries. The MH and HPS bulbs are way more intense in their light output, but their spectrums are more narrowly defined. Thus, indoor growers choose MH lamps for vegetative rooms because MH bulbs provide a whiter, bluer spectrum that keeps internode lengths short and plants squatter and bushier. HPS bulbs are used in flowering rooms, providing plants with a more yellow-orange spectrum that mimics the changing of seasons to fall, when plants generally fruit. HPS

bulbs also provide more light towards the red side of the spectrum, which is high in light energy (photons) and aids in bud development.

All three of these bulb types require a ballast to fire or ignite the bulb. A ballast is simply a device connected to a lamp, in between the power source (outlet) and bulb socket, that regulates electric current and supplies the starting voltage to the bulb. Both MH and HPS bulbs create their light in a vapor arc which burns in a sealed envelope inside the bulb. These envelopes are filled

with various gases, including sodium and mercury vapor, that enter an excited state to produce light once the arc is struck.

Traditional ballasts, also known as magnetic or core-and-coil ballasts, utilize basic ballast components such as a core that resembles a spool of wire wrapped around small steel sheets, a capacitor and an igniter. These traditional core-and-coil ballasts operate at approximately 90 watts and are usually quite heavy and durable, as the interior components are accessible and easily replaceable.

The newer electronic and digital ballasts are sleeker looking and lightweight, but more complex inside. To start, it should be noted that electronic and digital ballasts are not two separate types of ballasts – it is the given name for one specific type of ballast. These ballasts do not regulate electric current with a core, but rather with

There is no HPS bulb compatible with electronic and digital ballasts, nor can one be made.

semiconductor devices like transistors and microchips. One similarity though is that capacitors are usually found in both types of ballast, which also aid in the regulating of current. Moreover, electronic and digital ballasts rely on solid state electronic circuit boards, making repairs tougher, but in the end making them more efficient in terms of power consumption. Electronic and digital ballasts generally operate at around 50 watts.

The biggest difference (and most important in terms of compatibility problems with HID bulbs) between new electronic and digital ballasts and traditional core-and-coil ballasts is the frequency at which they operate. Traditional ballasts run at about 60 hertz, whereas electronic and digital ballasts run at nearly 20,000 hertz (20kHz) – an obviously enormous difference. However, it is this difference that makes electronic and digital ballasts both more efficient with power and less compatible with standard HID bulbs.

The compatibility issue will be explained further along in this article, but first we need to understand these differences in operating frequencies. In the US, electricity from the main power line runs at 60 hertz, thus traditional ballasts do the same. However, electronic and digital ballasts change this frequency to 20 kHz. This higher frequency keeps more of the gases inside our HID bulbs ionized in the arc stream, thereby increasing the efficacy (amount of light produced) of the bulb. At about 10kHz, the efficacy increases about nine percent and keeps climbing until around the 20 kHz mark, giving HID bulbs up to an 18 percent increase in efficacy with electronic and digital ballasts. While efficacy and efficiency are two separate and distinct terms, some will argue that getting more light output from the same amount of power is, indeed, more efficient.

Technology & Certification for Electronic and Digital Ballasts

A new model has been introduced to help consumers decipher which electronic and digital ballasts are best for them. Because SunPulse holds patents on their bulb technology, and because they are way ahead of the curve when it comes to digital bulbs, they have become the only certifiers of all electronic and digital ballasts that want a share of the ballast market.

SunPulse Certification Laboratories were formed in 1999 in response to the problems created by the mismatching of high-frequency (HID) electronic ballasts and 60 hertz lamps. This problem remained undetected and unresolved for many years. Manufacturers of traditional lamps, such as Philips, Sylvania, GE Lighting, Venture, Sunmaster, Ushio, Lumatek and other European brands were all made for 50-60 hertz, and none of those traditional lamps are certified for use on high-frequency electronic ballasts.

Who made SunPulse a certifying agency? In the absence of a "Consumer Reports" type magazine within the horticulture industry, as well as a lack of presence from the scientific community, an agency had to be formed that could gather the necessary information on ballasts and bulbs, analyze it, comprehend the analysis, identify the prob-

lems and come up with solutions. There was no agency that could perform all of those functions and remain truthful with the results for the sake of the end user; such an agency had to be created. ANSI regulations do not apply to electronic ballasts, so there is no existing organization that is truly qualified to understand what SunPulse Certified Labs aims to accomplish.

Having recognized that there was a lamp-ballast conflict, Gerald Garrison, of Gas Technologies, created the SunPulse Certification testing facilities to find the solution to the problem. It was evident that bulb failures are being caused by a range of problems from acoustic and magnetic resonance that contribute to the total distortion of the system, causing arc streams to become unstable. Standing waves, created by the high-frequency ballast, occur inside the interior jacket or envelope, destroying bulb components and unseating glues inside the bulb that were constructed for 60 hertz. The components inside the lamp were simply never designed for high-frequency digital and electronic ballasts that operate in frequencies ranging from 79 Hz to over 100 kHz (100,000 Hz).

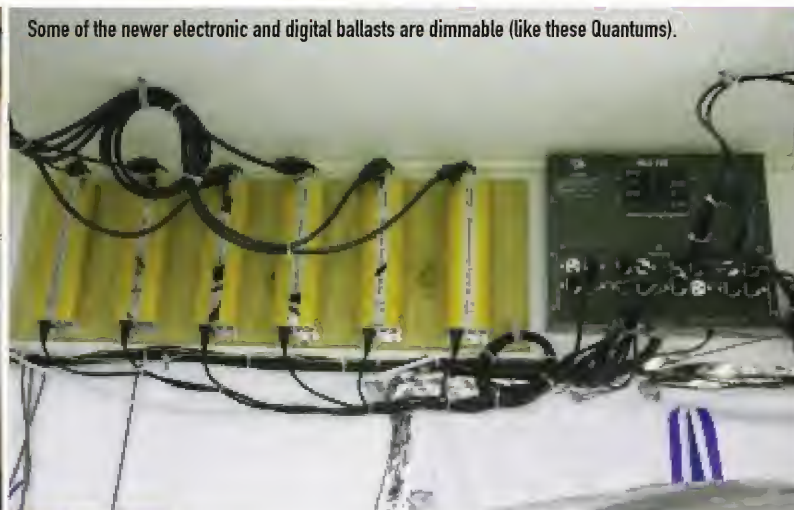
Imagine an opera singer singing a high note next to a crystal wine glass and you'll have an

idea of what is happening inside that lamp. It is important to note that there is no HPS bulb compatible with electronic and digital ballasts, nor can one be made that will work properly. It simply isn't possible with the current technologies that exist. These bulb failures are a global problem, not just isolated to the US. There are high-frequency electronic ballasts around the world, and there is a 100 percent failure rate when using them on the traditional 50/60 hertz bulbs as a result of the incompatibility.

Garrison's team is composed of world-class electrical and mechanical engineers, physicists, gas chemists, photo-biologists, scientists and researchers. The equipment used in the SunPulse Certified Laboratories is state-of-the-art, and complies with military specifications and standards. Some of the lighting data is sent to third-party laboratories for independent analysis, to ensure fair and objective testing and show that SunPulse Labs does not skew any data, for the benefit of themselves or anyone else. Electronic ballasts from around the world have been sent to SunPulse Certified Labs, giving them the largest archives of their kind in the world to use for the betterment of these technologies. In technology, if the end users (such as growers) are misled into failure, nobody wins.



The first certification center at the SunPulse Lamps labs.



Some of the newer electronic and digital ballasts are dimmable (like these Quantums).



The traditional core-and-coil (magnetic) ballasts are compatible with HID Bulbs.

Most growers have been reporting burnouts at a much more unmanageable rate.

Why Your Bulbs Are Burning Out

Startling new admissions from bulb manufacturers such as the EYE Hortilux bulb company here in the US have revealed that major bulb brands currently on the market are, in fact, not compatible with any of the electronic and digital ballasts being sold in grow shops around the world.

In a four-page, paid-for editorial written by the Hortilux company and published in Maximum Yield magazine (October 2008) – a horticultural publication not related to cannabis – the bulb manufacturer outlined some of its latest research that identifies the incompatibility, and its cause, between their HID bulbs and today's electronic and digital ballasts. But the scope of their research wasn't just limited to Hortilux brand bulbs. All major brand bulb manufacturers are suffering the same problems, including Sunmaster, Phillips and General Electric (GE). The Hortilux studies show that all of these companies' bulbs, when used in electronic and digital ballasts, have significantly decreased bulb life. While Hortilux maintains that bulbs might burn out after six to nine months in electronic and digital ballasts versus 12 to 16 months in traditional core-and-coil (magnetic) ballasts – an increase of nearly double the usual rate – most growers have been reporting burnouts at a much more unmanageable rate of three to four times faster. That's a lot of extra money being spent on bulbs for the growroom.

And it gets worse, believe it or not. The study presented by Hortilux states that "all lamps tested on electronic ballasts had advanced sodium loss and reduced lumens." The reduced lumens are not much of a surprise, given the rate at which bulbs are burning out, but the gas loss is an even more disturbing news flash. As it turns out, towards the end of their life – just before the bulbs burn out – a rupture occurs, releasing the gases inside the bulbs. This means that sodium, mercury and phosphorous vapors are covering our gardens – and the buds we have been smoking. This is certainly not a desired or healthy aftereffect, especially for those using cannabis medicinally.



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All of the major bulb brands currently on the market are not 100 percent compatible with electronic and digital ballasts...



We all know that moving backwards is not the answer.

... with one exception: SunPulse's Kelvin-rated bulbs.



The Science of (Bulb) Failure

In a call placed to the EYE Hortilux home office in Mentor, Ohio, a technical engineer from the Test and Measurement Laboratory confirmed that the published report was accurate and offered that a communication gap between bulb manufacturers in the United States and ballast manufacturers in Asia was probably the biggest culprit in the mess.

As we've revealed, the cause for the incompatibility is due to the much higher frequencies that the new electronic and digital ballasts run at. Traditional core and coil ballasts run at around 60 hertz whereas electronic and digital ballasts run at 20,000 hertz or more – a vast difference for sure. This difference causes what is known as *acoustic resonance* within the bulbs. Acoustic resonance is a term for an unstable arc condition within an HID bulb. It occurs when ultrasonic sound waves build up in the arc tube of the bulb and causes the light arc to flicker and swirl. This effect can actually be seen using light blockers or gels to view the light arc in a lit bulb's interior envelope (Note: Do *not* attempt to do this without the proper eye protection). In the end, this is what causes the shorter life of your bulb.

The Hortilux representative also confirmed another vital piece of information for the indoor grower: Only one current company in the market makes bulbs that are actually compatible with electronic and digital ballasts—SunPulse. These SunPulse bulbs work fine in today's high-frequency electronic and digital ballasts and in Hortilux's test trials they were the only brand to do so.

What This Means for the End User

While the published Hortilux statement seems to suggest we should revert to using old core and coil ballasts until the issues are solved, we all know that moving backwards is *not* the answer. Losing the merits of electronic and digital ballasts whose new technology boast advantages such as smaller, compact and lightweight construction as well as quiet, cooler running cores is not helping progress grow technology. And that's not even getting into the more energy-efficient aspects of today's newer ballasts. A better idea might be to start focusing on revamping the bulbs that we have been using for so long. We certainly know that the potential and knowledge to do so is there.

It is true, however, (as proponents for traditional ballasts might argue) that a standard must be established so that all electronic and digital ballasts run at a set frequency, thus allowing bulb companies to manufacture bulbs that will work with this latest technology. As such, a standard for frequency would allow bulb manufacturers to construct bulbs that can withstand the acoustic resonance the frequency creates. In fact, devices that operate at such high frequencies are usually subject to meet FCC regulations, so that may be the regulating factor in the end. But until then, growers must weigh the pros and cons associated with using standard bulbs with traditional ballasts versus using electronic and digital ballasts with digital bulbs. Finding the digital bulbs may be the catch, but as this information becomes more widespread and growers, shop owners and the industry as a whole begin to better understand the issues involved, there is no doubt that we will see more and more digital bulbs hitting the market.

If indoor cultivators want to use the more power-efficient electronic and digital ballasts, then the real solution is very simple and attainable. Go to your local grow shop and ask about the SunPulse lamps or visit their website to order SunPulse systems factory-direct (sunpulselamps.com). There is no need to be a victim just because the industry is flawed. 🌱

To see lights in action, watch here.



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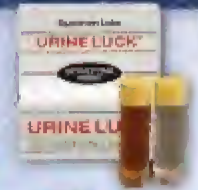
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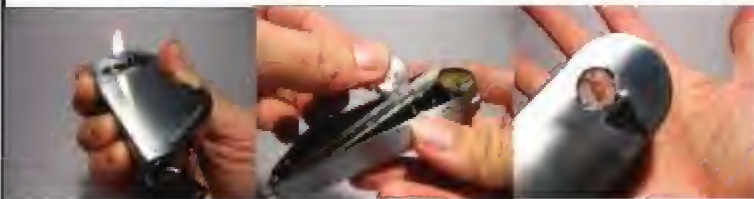
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The Resin Factory is comprised of six rooms: a mother/clone room, a vegetative room and four flowering rooms.

TRICHOME TECH: INSIDE THE

RESIN FACTORY



The mother/clone room.

It had been some time since I visited K, award-winning proprietor of the Trichome Technologies medical-cannabis research facility. For the past year, I've basically been trying to invite myself over to sample some of those heirloom strains of his, but he kept telling me to wait, promising the next time we met, he'd have something truly remarkable to show me. When the time finally came, he picked me up, and I wondered why we weren't going to the usual place. It turns out that, for the past year, K has been building a commercial production facility more than four times the size of the one we last profiled in *HIGH TIMES* (Sept. '06 HT). I congratulated him on his latest endeavor; it was certainly worth the wait. By Chris Simunek. Photos by Freebie

The Facility

Comprising a total of six growrooms, the facility was designed and constructed from floor to ceiling by K and the Trichome Tech crew. One room is devoted to clones, mother plants and tissue cultures (stage 1), another to vegetative plants (stage 2), and the remaining four to flowering plants (stage 3). The flowering rooms are kept on different rotations, 10 to 14 days apart, depending on the requirements of the varietal. K designed it this way for a number of reasons. For one thing, if he wants to experiment with tweaking a crop's nutrient levels, he won't have to sacrifice a gigantic harvest if the experiment goes wrong. Also, when you consider the sheer amount of marijuana being grown here, a single harvest would be a nightmare to cut, dry and cure, so by separating it into four different harvests 10 to 14 days apart, K is able to maintain a symbiotic rotation.



The Twister is the Rolls Royce of automatic trimmers.

DripCaps cover each rockwool cube and provide nutrient delivery via four drippers.



An ultra-sonic fogger pumps a mist through the grow channel.



K has been experimenting with fogponics, a process of delivering micro-misted, oxygenated water to the plants' root systems.

Grow Channels and 'Fogponics'

The vegetative room has three tables, while the flowering rooms each contain four. The tables are all on wheels, which allows them to be easily pulled apart so that K can access plants toward the center of the canopy. The vegetative tables hold twice the amount of plants as the flowering tables in roughly the same amount of space; this way, there are always more plants than needed, and only the best ones are chosen to finish.

All of the tables have been designed to K's precise specifications. In his 20-plus years of growing, K has studied all aspects of the cannabis plant and has envisioned what, for him, is the perfect grow environment. In this facility, that environment begins with the custom-built tables, which allow nutrients to be delivered via a drip system and the roots to be kept oxygenated and at peak levels of humidity through a system he calls "fogponics."

For the top-feed drip system, K uses a brand-new product called a DripCap (cubecap.ca), which is superior to the standard-issue dripper for three reasons. First, it covers the rockwool cube, inhibiting algae growth, which can rob oxygen and nutrients from the plants. Second, it boasts four drippers (i.e., four points of nutrient delivery), so if one dripper clogs, the other three will still maintain optimum plant health. Third, it promotes water conservation and minimizes runoff. Each row of plants is aligned along a specific grow channel, and each channel is connected by a PVC tube that delivers nutrient to the drippers. These PVC tubes are connected to feeding hoses that, in turn, are hooked up to a reservoir in each room; these reservoirs contain a submersible pump that delivers the nutrient solution on a schedule set by a timer. The feeding tubes all have detachable, quick-release fittings where they meet the table, which allows them to be removed with ease.

The tables have been designed so that underneath each grow channel is a 4-inch space where the roots hang down once they've broken through the bottom of their rockwool cubes. It is here that K has been experimenting with fogponics, his process of delivering micro-misted, oxygenated water to the plants' root systems. "It's a common misconception that plants take in CO₂ and expel oxygen exclusively," K explains. "Plant roots need oxygen, which is normally provided to them through capillary action by water ... and also, as the medium dries, it draws in available environmental oxygen." To this end, K has devised a system that expels stagnant air accumulating in the 4-inch space beneath the surface of the table where the roots hang and replaces it with fresh, filtered, oxygen-rich air in the form of a fine mist. Next to his main reservoir, which holds the nutrients for the top-feed drippers, is a secondary reservoir with an ultra-sonic fogger that produces the mist, which is then delivered via a small, sealed fan to an overhead plenum that, in turn, disperses it to each separate grow channel. Pressure from the fan blows depleted air out of the root-growth chambers and replaces it with new air. This happens every hour for five minutes.

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Plants in the early vegetative stage.



Clones

K keeps mother plants of up to 10 different varieties on hand at any given time. From these, he takes his clones and tissue cultures, depending on the needs and requirements of medical dispensaries.

Clones in rockwool.



The clones are cut and planted into 2-inch rockwool cubes using Vita Grow, a ready-to-use, fast-penetrating liquid rooting compound. The cubes are then placed into 4' x 8' trays with humidity domes on top and covered with T5 compact fluorescents. They're kept under constant light at a temperature between 75°F and 80°F and a humidity level of 75% to 80%. It's important for the clones to receive fresh, oxygen-rich, filtered air at all times. It takes 14 to 21 days for them to complete rooting, depending on the strain; tissue cultures require approximately 30 to 45 days (see sidebar).

The clones are then plugged into 3-inch cubes at the start of their vegetative stage, where they remain until harvest. "We don't put them in bigger cubes for flowering so as to minimize the amount of waste and pollution to the environment," K explains. "The grow channel has the smallest carbon footprint of any system available." Although the size of the medium doesn't change from vegetative to flowering, the flowering tables hold half as many plants as the vegetative tables, so the plants are given twice as much space to branch out. Each plant is individually staked, eliminating the need for yoyos, trellises or nets. (The stakes, which fit right into the table, are available from futuregarden.com.)

Vegetation

After rooting, the clones are transferred to their next environment, the stage 2 (vegetative) room, for 10 to 14 days, depending on the variety, growth rate and amount of available space in the flowering room. In the vegetative stage, temperatures can vary from 70°F to 75°F, depending on the availability of filtered fresh air (oxygen) and proper CO₂ levels, while humidity is maintained at 65% to 75%, depending on the rate of development.

Bubba Kush



Flowering

Once the plants are transferred to the stage 3 (flowering) room, both the nutrient regimen and lighting schedule are changed for bud production. The temperature is kept between 60°F and 70°F, and humidity drops to around 65% to prevent mildew and gray mold. Some varieties may receive lower temperatures and humidity levels to accentuate color and, in the case of equatorial *sativa*-dominant strains, to finish flowering. In addition, a lower level of humidity in the last three to four days before harvest has been known to heighten levels of THC and other beneficial essential oils.

TISSUE CULTURE

By Normal

What the heck is tissue culture, and why should I care?

Well, first off, the more correct name for what we do at home is "micro cloning," because true tissue culture (TC) is tedious and only done in a lab. Micro cloning is sort of like regular cloning, but done sterile and on a miniature scale in jars. It's quickly becoming the way that most clones are made and genetics are kept, which is why you should care (as an example, almost all of the plants at Home Depot are TC). Think limitless numbers of plants that are all identical, but without the huge mother rooms and problems we're all used to.

The process, in a nutshell, is this: Take small tip cuttings from a mother plant and wash them thoroughly with soap and water, then alcohol, then diluted bleach water. These cleaned tips are then put in a special gelatin mix in small jars to grow without roots as a micro bonsai. What's "special gelatin"? It comes in TC kits: Officially, it's purified water, standard nutrient salts, vitamins and amino acids, branching hormone, preservative, and gellan gum to make it all gelatinous. Sometimes I add food coloring to tell the genetics apart without labels.

Every five weeks or so, the cultures will grow from one node to approximately five and then are cut apart and put into five new jars. This is the multiplication stage: Repeat as necessary until you have enough new moms to supply your needs. Whenever you need clones, you cut it into five parts as before, then put them in a jar with rooting hormones instead of branching hormones and wait two weeks. At that point, it's time to move them to a standard clone tray with grow medium and a dome to let them plump up a bit from 1 inch to more like 5. You now have a whole tray of beautiful clones that will grow into large, productive plants.

Pros:

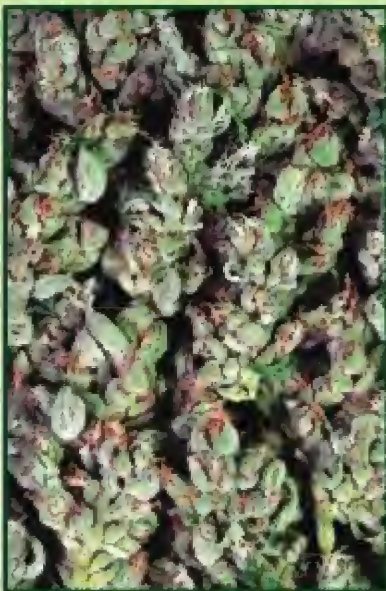
- * Keeps 100 strains on a shelf under a single T5, and you only have to re-jar every five to eight weeks.
- * Watering is no longer needed ... YEAH!
- * Genetic drift is eliminated, and even damaged genetics can be brought back to their original vigor.
- * The wattage used for mothers and clones is greatly reduced.
- * Bugs and mold are no longer part of the process.
- * There is no other practical way to provide high numbers of clones (thousands at a time) that are all short, with a high node count and at the same growth stage, which is perfect for a "sea of green" setup or rotating gardens.

Cons:

- * You have to plan five weeks ahead, versus two for traditional cloning.
- * There's a 10-week initial lead time to deal with.
- * It's a clean process, so if you have an aversion to being clean, you may have some problems.

There are places out there that supply all of this stuff in kit form. One is Pure Food Gardening, which you can find at planttc.com.

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	Flora Micro	Flora Gro	Flora Bloom	pH	PPM	Notes
STAGE 1 (Clones & Seedlings)	1/4	1/4	1/4	6.7	300	adjust pH to 6.2
STAGE 2 (Vegetative)						adjust pH to 6.2
early:	1/2	1/2	1/2	6.5	500	
middle:	3/4	3/4	3/4	6.5	700	
late:	1	1	1	6.4	880	
	1 1/4	1 1/4	1	6.4	1030	
	1 1/2	1 1/2	1	6.4	1170	
STAGE 3 (Flowering)						adjust pH between 5.8 - 6.8 depending on method, media & varietal
early:	1 1/2	3/4	1 1/2	6.3	1090	
middle:	1 3/4	1/2	1 3/4	6.3	1040	
late:	2	1/2	2	6.2	1270	
	2 1/4	1/4	2 1/4	6.1	1360	
	2 1/2	1/4	2 1/2	6.1	1650	
	2 1/2	1/4	2 3/4	6.0	1680	
	2 3/4	0	3	6.1	1730	

For some varieties and plants that refuse to mature or have prolonged flowering tendencies

IMPORTANT: All listed portion mixing instructions are measured in ounces per gallon. All water used for the nutrient mix must be filtered. Always adjust pH after each application by using pH Up or pH Down as needed.



A charcoal filter attached to an exhaust duct removes odor before air hits the outside.



A refrigeration unit keeps temperature at desired levels.

Feeding

Whether the plants are in their vegetative or their flowering stage, they're watered via the DripCap four times daily (as well as once in the middle of the dark period to ensure proper moisture in the medium overnight). Before water is delivered to the drip lines, it's filtered to ensure that no clogs occur. In between those water cycles, a five-minute fog burst disperses stagnant air from the grow channel and delivers fresh oxygen and moisture to the roots.

Trichome Tech uses General Hydroponics fertilizers at all stages of plant growth (see chart for schedule). K is also a fan of foliar feeding, which he describes as "akin to giving a plant a daily multivitamin." He foliar-feeds in the early and middle stages of development up until two or three weeks before harvest. "I consider it a conservative practice," K notes, "so I never exceed one teaspoon of FloraMicro, one teaspoon of FloraGro and one teaspoon of FloraBloom per gallon, all of which are manufactured by General Hydro. In the earlier stages of development, I utilize Spray-N-Grow, Superthrive and Nitrozyme in an amount equal to half the manufacturer's recommendation, along with a wetting agent to help spread the water on the surface of the leaves. Foliar feeding is applied first thing every morning."

Lighting

In both the vegetative and flowering rooms, K uses 1,000-watt Venture Lighting metal halide (MH) and Hortilux High Performance high-pressure sodium (HPS) bulbs. The vegetative rooms have a mix of six MH and four HPS lights covering a 12' x 12' canopy composed of plants on three 4' x 12' tables. In the flowering rooms, he uses a mix of 12 HPS and eight MH lights over a 16' x 12' canopy composed of four 4' x 12' tables. In the near future, K hopes to switch to Hortilux dual-arc bulbs, which provide both MH and HPS light to

achieve optimum red and blue spectrums, together with 1,000-watt dimmable digital ballasts and air-cooled hoods.

Each light is attached to its own separate Powerhouse convertible ballast (available at hydrofarm.com). All 90 ballasts are located outside the growrooms in a custom-built ballast/refrigeration room at the back of the facility, thus eliminating any heat that the ballasts could add. At first, having the ballasts so far from the bulbs created a problem, because the HPS lights wouldn't fire up. After careful examination, it was discovered that the power diminished as it traveled the distance through the cord to the lamp. This was corrected by installing remote igniters in the lighting reflectors that provided the additional power needed to fire up the bulbs.

The vegetative plants are kept on an 18-hour-on, six-hour-off light schedule. When the plants are ready to move from the cloning station into the vegetative room, they're slowly acclimated to the increased lumens by progressively turning on more lights over the first week. K finds that this practice causes less of a shock to the young plants and also mimics natural sunlight. In the flowering stage, the light schedule changes to 12 hours on and 12 hours off.



Each room is lit with a mix of MH and HPS lights.

Environmental Controls

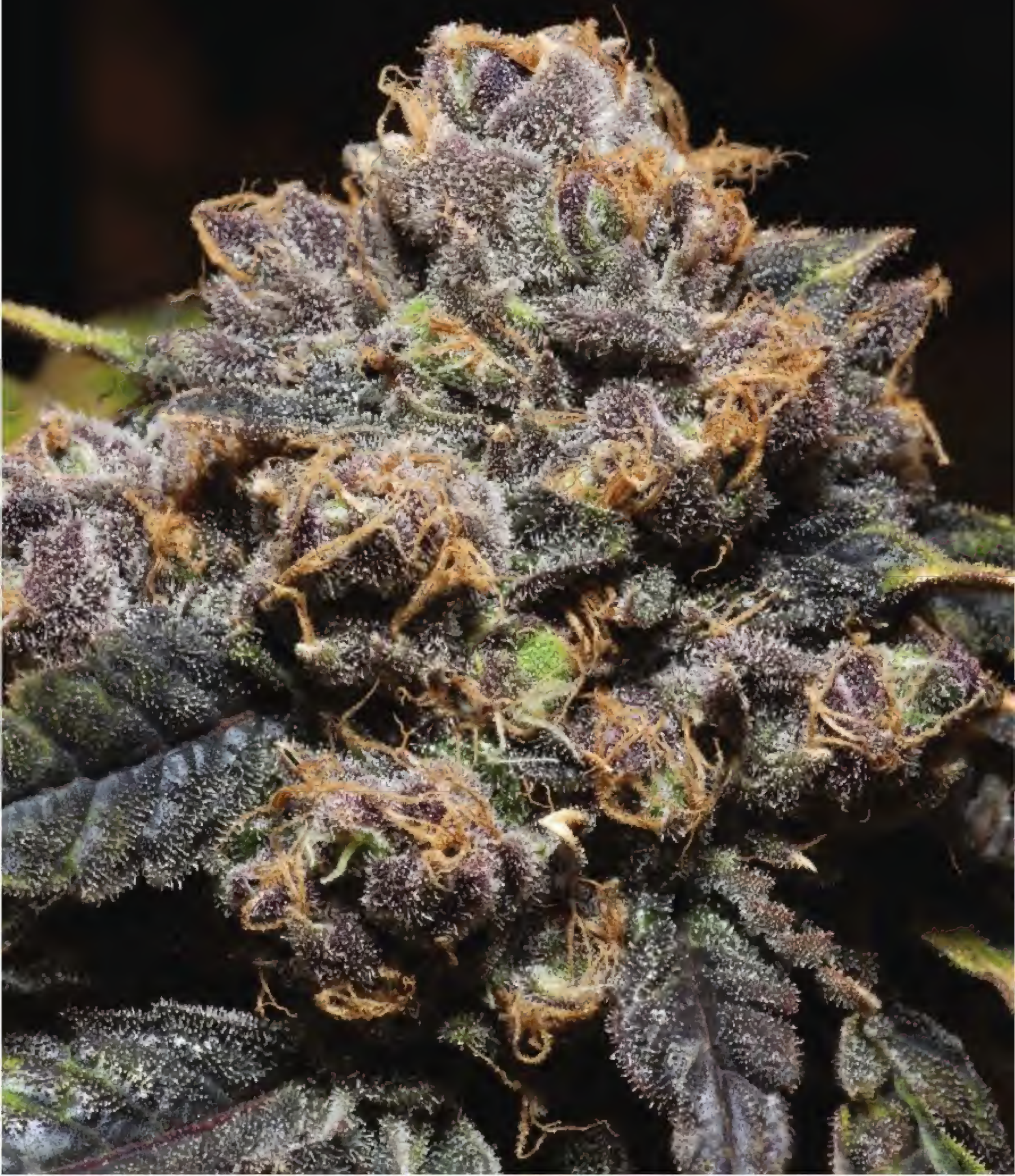
All aspects of the garden environment work symbiotically, meaning that whenever one element gets too high or too low—temperature, humidity, etc.—there is an automated reaction to adjust it. The electricity that powers all of the lights, timers, environmental controls, circulation fans and CO₂ emitters is centrally located on one power interface. The control panel is separated into sections: lighting/timers, ventilation/timers, and refrigeration/timers/high-low control. Each light is on an individual timer that allows it to accommodate 12- or 18-hour cycles; this setup also allows K to add or subtract lumens from the room as needed.

Each room has its own separate refrigeration unit that is digitally controlled: Whenever the temperature in any room gets too high, the air conditioning comes on. The unit has six fans that draw air past the refrigerant-filled tubing to absorb heat and then deliver it to the ballast room, where it is dissipated and forced outside with extraction fans. If the humidity or temperature gets too high, air is vented out of the growroom at a rate of 1,000 cubic feet per minute.

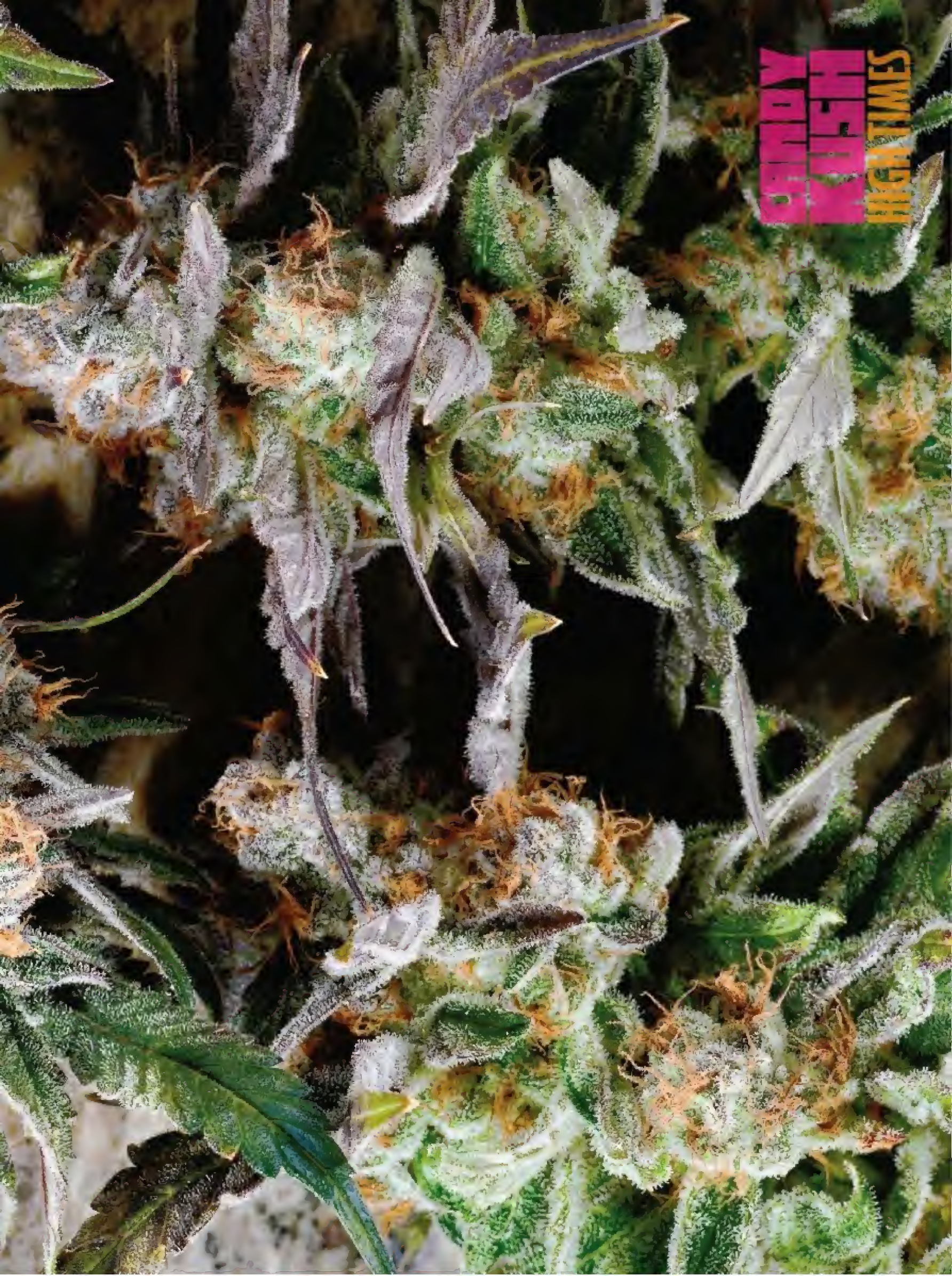
Each room contains a separate climate controller that continuously measures CO₂, oxygen and humidity levels. Two commercial-size dehumidifiers eliminate excess moisture from the air; the wastewater is then filtered, sterilized and utilized for foliar feeding. When the humidity is too low, a small evaporative cooler kicks on to add moisture.

There is air flowing in and out of the growroom at all times to maintain optimum oxygen levels. Before entering the growroom from outside, the air goes through a pre-filter to remove dust and large debris and then through a HEPA filter that traps molds, spores, mites, etc. Air exiting the growroom is passed through

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Plants are harvested when resin heads begin to turn opaque. (below) An experiment flowering OG Kush early to limit vertical growth.



Laboratory conditions are maintained so as not to compromise product quality.

Harvesting

Those who tend smaller gardens have the luxury of harvesting parts of their plants as they ripen, or allowing them to linger in the flowering room. But when you're growing en masse on a rotating schedule, this isn't possible: Handpicking buds from plants takes too much time, and the plants have to be moved out to make room for the next batch. For K, harvest time varies according to strain: The first to mature are the first to get cut down. The plants are taken whole, cut once at the base.

For years, K would harvest once the resin heads began turning from opaque to amber, but he's recently rethought his timing thanks to a study by Dr. Paul G. Mahlberg, who found that THC in the resin head is at its peak when it's still *clear*—not opaque and certainly not amber. Dr. Mahlberg stuck a tiny syringe into the bulbous head of the trichome and extracted its contents, then analyzed it for THC. The result: Without a doubt, THC is at its highest *before* the trichome turns opaque. This makes sense, when you think about it: Who harvests fruit when it's turning brown?

Armed with this info, K completely altered his harvest schedule. Now he uses a 20x loupe or handheld microscope hooked up to a computer, which throws images of the trichome on the screen for easy viewing, and he harvests at the first sign of opaque trichomes, when the majority on the plant are still clear.

Twenty-four hours before harvest, all large fan leaves are eliminated from the plant while it's still in the system to ease trimming. First thing next morning, before the lights come on, the power is turned off and the trimming process begins. The plants are cut at the base and all buds and budlets are hand-trimmed into 20-gallon, plastic-lined



bins and then poured onto a sorting table for quality control. The buds and budlets are then fed into two Twister power trimmers and automatically deposited into the same bin they came out of, completely manicured; the first Twister does the trimming, the second the polish. According to K, the Twister has completely revolutionized the way he harvests.

"Basically, when we designed this facility, we designed it to be harvested every 13 days," he says. "After the first harvest, with a six-person staff, we realized it could take six to eight days to harvest that much product. For two years, I had been investigating automatic trimming systems. Most of the stuff I've seen on the market has been inferior. I have never used one because my product is too high-value; I don't want my product getting beat up and degraded. We stumbled upon these guys called Keirton Manufacturing, who make the Twister trimmer. The quality of this piece of machinery is far superior to any product out there. They didn't cheap out—right down to the wheels with the steel rims. It never breaks, it's easy to clean, your buds look great after trimming, and it's able to do 100 pounds of dried product in one day.

two charcoal filtration units with UV sterilization to remove all cannabis odors. Four oscillating fans spin at all times, blowing air toward the lights and plants and ensuring that no hot spots build up.

As a result of all these separate controls and timers, there's a lot of room for K to adjust the minutest detail of the grow environment. Since this is a research facility and K often performs experiments with light, humidity, nutrient levels, feeding schedules, etc., the ability to change one element in the environment while the rest remain constant is essential. Also, as K points out, what works for one variety doesn't necessarily work for another.

"Each strain is an individual and must be treated accordingly as far as pH, N-P-K and ppm are concerned," he says, "which is an ever-changing and evolving cycle due to the different stages of plant development and their requirements. For instance, OG Kush has completely different wants and needs than, say, a Granddaddy Purple. It's more of a *sativa*-dominant; you turn the lights back earlier on the OG to control vertical growth—as opposed to the GDP that, being an *indica*-dominant, stays shorter and more compact and can tolerate and accommodate a longer vegetative period."



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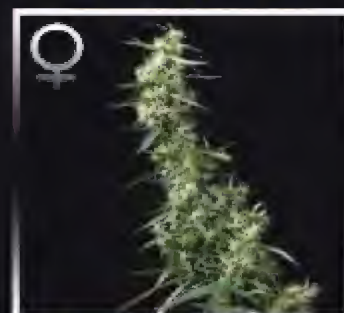
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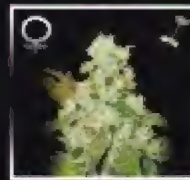
BIG BANG



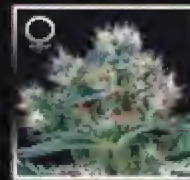
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Once manicured, the buds are placed onto 4' x 8' door screens that are laid out next to each other by varietal, and the surrounding environment is warmed to 78°F, with a continuous filtered air flow to the outside environment for both intake and exhaust. To aid moisture dissipation, oscillating fans keep the air moving within the rooms, while stand-alone charcoal filter/fans continually scrub it. Commercial-size dehumidifiers also eliminate unwanted moisture.

"The key is to dry the buds as a whole, rapidly—but not too rapidly, which would diminish aroma and flavor as well as degrade THC levels at higher temperatures," K explains. "Also, air movement and moisture elimination are always a must to prevent any possibility of mold or mildew."

The buds are periodically rotated to ensure even drying. Typically, they're allowed to dry like this for three or four days. At the point when the smaller buds are slightly overdried and the larger buds are still slightly moist, they're combined and placed in plastic containers for 24 hours. The purpose here is to create a homogeneous, evenly dried product.

Everything is then placed back onto the drying racks to eliminate any unwanted residual moisture. The buds are checked every hour until peak dryness; then they're ready for curing and storage in a cool, dark, dry room. Peak dryness to K means that, when he bends a long bud, he can hear the fiber inside cracking, but it doesn't break in half. From there, the buds go back into their containers and are checked every other day to allow the air in the containers to be exchanged and ensure that no mold develops. This process can continue for as long as 21 days, until the buds are ready for market.

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Honey Oil

In addition to finely manicured buds, K winds up with pounds and pounds of mulched marijuana leaf that has been chopped too fine to be used for standard resin-screen or water-extraction hashmaking. But considering that shake contains anywhere from 2.5% to 10% THC, it certainly isn't going into the garbage. For K, cannabis oil was the only answer.

Because California law prohibits the manufacture of oil using flammable liquids, butane extraction—K's preferred method—wasn't an option. His second preference is to use the supercritical CO₂ extraction method: All waste leaf material is placed into a containment vessel, and liquid CO₂ is circulated past it for a nine-hour period, whereupon the CO₂ is separated and recaptured and a fine oil is left behind. For this method, he recommends products from Eden Labs (edenlabs.org), a company that has been at the forefront of plant extraction technology for the past 15 years.

For growers in medical-marijuana states other than California, K recommends the Tamisium Butane Extractor (tamisiumextractors.com). This apparatus recaptures and reuses the butane utilized for extraction purposes and emits no fumes into the environment that could prove to be flammable. "It's a completely safe method for extraction," K insists. "It produces an incredible finished product of a golden honey color that can be further refined and purified if you so desire." ✨

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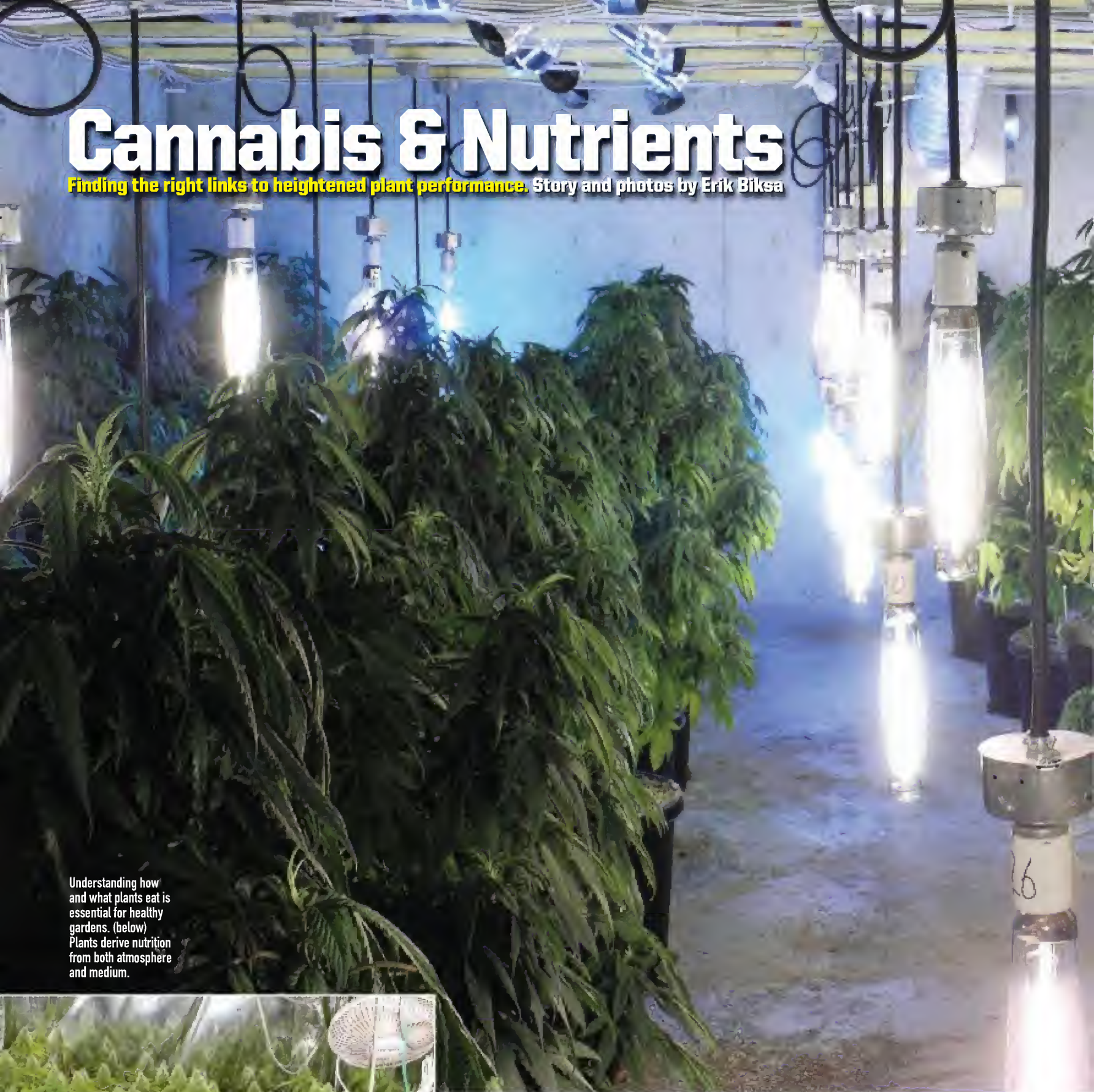
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Cannabis & Nutrients

Finding the right links to heightened plant performance. Story and photos by Erik Biksa



Understanding how and what plants eat is essential for healthy gardens. (below) Plants derive nutrition from both atmosphere and medium.



Law of the Plant

One way to examine the performance capabilities of your indoor medical grow might be to compare it to a high-performance car. A driver may have the finest engine, wheels, handling, suspension and exhaust system all rolled into one beautiful machine; however, if just one part of that vehicle isn't working, you may never get out of the driveway.

In some respects, your indoor growroom isn't much different, especially when it comes to nutrients in both the root and shoot environments. If just one important factor is out of tune or not functioning well, your grow may only perform up to the level of that malfunctioning component. In fact, an agricultural principal known as Liebig's Law of the Minimum states that growth isn't determined by all of the resources available to a crop, but rather by the *scarcest* resource, which acts as the limiting factor. In other words, the chain is only as strong as its weakest link—and if just one vital thing is missing, no amount of other resources can make up for it.

Thus, the completeness of the grow environment, including what we *feed* the garden, is of the utmost importance, especially if you intend to unlock the fullest potential of the cannabis genetics you've selected to grow.



A Tale of Two Worlds

A wise grower once commented that plants live in two very different worlds at the same time: the light environment (leaves, buds, etc.) and the dark environment (roots, microbes, etc.). It's really quite amazing, when you think about it: Plants have developed very different organs and functions for two very different environments that must work in harmony for the survival and proliferation of the whole unit. Both of these "worlds" are very distinct, including the way they provide nutrients to your plants from the surrounding environment so that you can grow the biggest, tastiest and most potent buds possible.

When it comes to plant nutrition, the majority of growers will think of feeding programs, N-P-K ratios (nitrogen-phosphorous-potassium), bloom boosters, vitamins, carbohydrates, enzymes and so forth. While these are all very important factors, consider that oxygen (O₂) and carbon dioxide (CO₂) are absolutely crucial elements in your plants' nutrition and are used in rela-

tive abundance. Plus you can, in fact, control and deliver these important elements at accelerated levels for faster growth, bigger yields and fewer potential problems.

During photosynthesis, the plant will take in CO₂ from the air during the "day" part of the light cycle and then combine it with water, nutrients and light energy to produce glucose (C₆H₁₂O₆), a chemical form of energy that the plant stores and "burns" to sustain growth. The aboveground green portion of the cannabis plant (i.e., its leaves) takes in the light energy and carbon dioxide, while the belowground portion (i.e., the roots) takes in the water, nutrients and oxygen. If this equation isn't well balanced, your indoor garden isn't going to give you the best results possible. And if things are *really* out of whack, it could develop serious problems, such as diseases that can rob your crops of yield and quality. This is why it's important for growers to optimize and control the nutrients available to their plants in both of these very different—but equally important—worlds.



Plant leaves breathe in CO₂...

Bridging the Gaps

Thanks to the leaps and bounds that have occurred in the development of plant-growth technologies, it's now a lot easier to take control of the levels and ratios of nutrients in your reservoir and from the growing atmosphere itself. Veteran cannabis growers today may be able to yield twice as much from their crops in the same amount of space as they did just 10 years ago. Consider that some growers are now able to reap two—even three—pounds of very high-quality cannabis in only a 4' x 4' area of space. This is no accident: It's the result of selecting stellar cannabis genetics and fuelling growth rates via an optimized grow environment, which of course has much to do with the nutrients, minerals and vitamins given at both the root and shoot levels of the plant.

The good news is that this doesn't need to be very complicated. By using well-developed crop-feeding programs engineered for cannabis production, and by enriching the upper atmosphere with CO₂ while providing elevated levels of O₂ at the roots, growers are well on their way to success. Let's take a look at some important ways to supply your crops with the right type of nutrients and, more importantly, at the correct levels and balance to create the perfect marriage of elements that fuels professional-grade cannabis production.



... and roots absorb both nutrient minerals and oxygen.

Base Nutrients

Base nutrients are commonly referred to as the “macro” and “micro” elements. They are supplied to the plants through synthetic and organic fertilizers, nutrient-enriched mediums, composts, etc. The term “macro element” describes the vital nutrients that are used by the plants—and supplied by fertilizers—in the greatest quantities. Typically, these are nitrogen (N), phosphorous (P), potassium (K), calcium (C), sulphur (S) and magnesium (Mg).

The “micro elements” are just as important, so don't let the name fool you: It just means that plants use these elements in relatively smaller quantities. These include iron (Fe), zinc (Zn), manganese (Mn), copper (Cu), boron (B) and molybdenum (Mo). Recently, scientists have also started to recognize the significance of “sub-micro” elements in plant health, including such elements as cobalt (Co), selenium (Se), nickel (Ni) and sodium (Na). Sometimes, these sub-micro elements play a slightly less direct role; for example, they may help to nourish and sustain beneficial microbial life that surrounds the plant's root system, which is essential in organic gardens.

For the best results possible, take advantage of crop-feeding programs and base-nutrient formulations that are engineered specifically for medical-cannabis production. Typically, the best synthetic nutrients come in A and B formulas that are used for the vegetative and budding phases, respectively. Keeping the nutrients in separate A and B “packages” helps to prevent any undesirable reactions of nutrient concentrates, and it also allows the manufacturer to better vary nutrient ratios. These sometimes include a micro-nutrient package, as well as optimized formulas for the distinct phases (i.e., vegetative and budding) that cannabis plants go through.

Good base-nutrient formulations will also supply elements, typically the micros, in the form of chelates. A chelate is an organic molecule that bonds with electronically charged metal particles. Chelation is a process in which the nutrients are altered on a molecular level to improve their availability for absorption by root systems under a wider range of growing conditions. The best synthetic base nutrients use multiple forms of chelation and will also chelate some of the macro nutrients, such as calcium. This ensures the widest range of nutrient availability, so your plants' ability to take in nutrients isn't as tightly limited by factors like pH. Some elements, like iron, are very sensitive with regard to absorption at different pH levels, so having multiple forms of chelation means that your crop can take in more nutrients to avoid deficiencies within an intensive growing environment.

One very recent development in nutrient technology are the “pH Perfect” nutrients, which automatically correct the nutrient solution to the optimal pH level, regardless of it was to start with. These highly engineered nutrients will continue to keep the pH at optimal levels, self-adjusting as different nutrients and water are taken up by the plants, which would otherwise cause the pH to drift out of the optimal range for absorption.

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Digital meters must be used to monitor CO₂ levels (in PPM) in indoor gardens.

Carbon Dioxide

Many cannabis growers recognize the significant impact that elevated CO₂ levels can have on improving yield, plant health and growth rates. After all, CO₂ is a vital nutrient in the photosynthetic process. If CO₂ is lacking in the grow atmosphere, plants—regardless of how well optimized the other nutrients are—will only be able to produce up to the level of the limited amount of CO₂ that's available to them.

Supplementing the grow environment with elevated levels of CO₂ can certainly help buds pack on weight—but, as with solid nutrients, the demand for this element by cannabis plants will vary throughout their different phases of development. It should be noted that most ambient CO₂

Tightly sealed grow-rooms sometimes require raising the CO₂ level for better growth.

levels are plenty sufficient for great plant growth given regular air exchanges and circulation, but boosting these levels is one way growers attempt to supercharge the process. However, as stated before, all of the other integral parts of the plant's environment (including nutrient programs) must be precisely balanced.

Using an infrared (IR) CO₂ monitor/controller, coupled with a CO₂ gas cylinder (tank) or a propane-fueled CO₂-generating device, is an effective way to monitor, control and supplement the levels of CO₂ available to your cannabis plants. This option becomes increasingly important in tightly sealed growrooms, where a garden full of healthy plants can consume the ambient CO₂ levels—300 to 400 ppm (parts per million)—in a matter of hours. Once all of the CO₂ is used up, the plants' growth rates will slow to a crawl at best. Sealed gardens require raising the CO₂ level, sometimes to 1,000 ppm or beyond, depending on how hard the garden is being driven. Your plants can then use more of the light energy provided, while consuming more base nutrients, water and oxygen to create a higher rate of photosynthetic activity. Note that fast-growing, healthy plants are often less prone to common insect and disease problems, thereby increasing crop quality while helping growers to avoid potentially harmful chemical controls for these common disorders.

Nutrient Additives

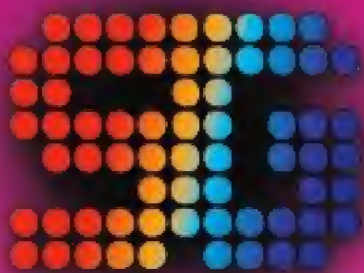
While not 100% necessary for the survival of your plants, some nutrient additives are in fact quite important if you're looking to achieve the modern indoor-harvest pinnacle of 2 pounds per 1,000-watt light (roughly 1 gram per watt) that advanced growers are now able to achieve. Nutrient additives may contain a variety of ingredients and are typically engineered for specific stages of growth, often being applied only for a few targeted weeks in the plant's development rather than throughout the entire grow cycle.

Bloom boosters are a common nutrient tool used by cannabis growers to improve the yield and quality of the buds they grow. Using the right bloom booster can improve the size, density and essential oils of cannabis flowers. Typically, these types of additives increase phosphorous (P) and potassium (K) levels during the peak bloom phase. Note that formulations are available for each specific stage in bud development, such as the transition to budding from the vegetative stage, peak flowering, and ripening.

It's important that your P-K ratios are well balanced. For example, an excess of phosphorous may not help your plants at all and could even hurt them if the potassium is too low (remember Liebig's Law). However, when balanced with potassium—while at the same time ensuring ade-

quate calcium and iron levels in the nutrient solution through your engineered feeding program—an extra helping of phosphorous can enhance both yields and quality. The best types of boosters may go even further by supplying a balanced ratio of bioactive ingredients like amino acids, vitamins and co-factors (compounds that aid protein function) along with the macronutrient charge they provide. All of these ingredients can work together in harmony, creating a synergy for increasing plant mass and quality.

Other common types of additives that can improve yields, plant health and quality include digestive enzymes, full-spectrum B vitamins, microbial inoculations, and other naturally occurring substances that can stimulate or regulate your cannabis crop in different phases of development. One word of caution, however: Growers need to be very careful not to mix different types of fertilizers, as the varying chemical arrangements and combinations can sometimes react negatively with each other. For this reason, it's best to choose one brand of nutrients for a garden and stick with it to the end. Furthermore, mixing synthetic or manufactured nutrients with certain organic agents can also be detrimental to gardens. Oftentimes, beneficial microbes and essential microorganisms added to gardens are killed or nullified by harsher synthetic nutrients.



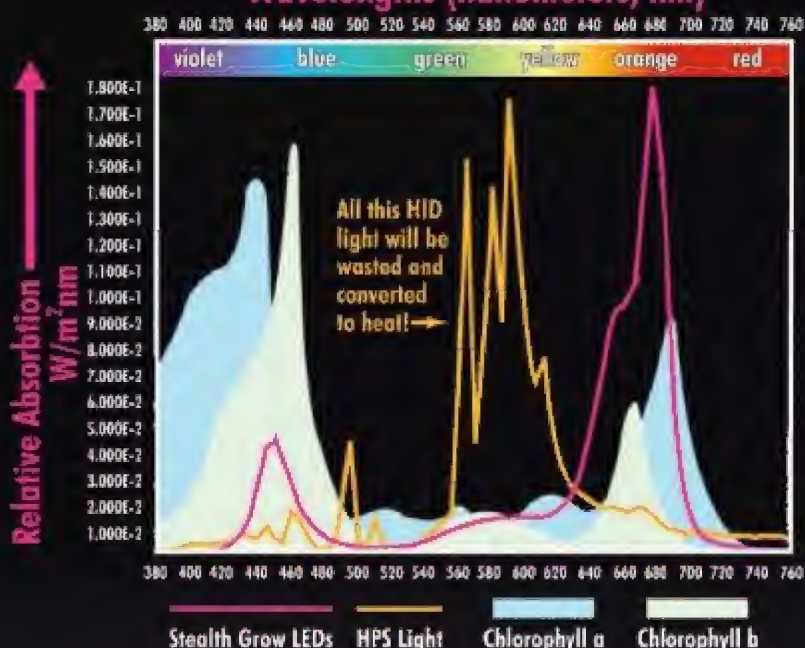
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Indoor grows generally utilize mixing tanks for nutrient solution.



Hydro systems like these deep water culture (DWC) buckets can supercharge nutrient uptake.

Oxygen

This is often the most overlooked yet highly crucial factor to the success of your crop. Cannabis plants love to have lots of oxygen at the roots. While highly porous growing mediums help to improve the air levels around plant roots (similar to how CO₂ levels work with the leaves), the oxygen in the root zone may become quickly depleted during faster growth periods and warmer growing conditions. A lack of oxygen at the roots will slow growth and limit yields, even if the other nutrient levels are maximized. In fact, root oxygen is often the unseen limiting factor in amateur and professional indoor-grow setups alike. If oxygen levels remain very low for extended periods, the likelihood of encountering root diseases also significantly increases.

If you grow in soil, the easiest way to get more oxygen to the roots is to increase the pore space in the growing medium. This can be as simple as adding some drainage rocks at the bottom of containers or incorporating materials such as coco coir, wood chips, perlite or vermiculite into the growing medium. Aerating the water or nutrient solution for several hours before application can give your plants a temporary surge of dissolved oxygen (DO) at the root level as well.

For the ultimate in DO levels at the root zone, some growers make the switch to water-culture systems, or hydroponics, which infuse the nutrient solution with higher levels of oxygen than would normally occur in common soil and soilless-mixture gardening. If you want to get the most out of all your other nutrients (base nutrients, additives, CO₂ levels, etc.), then you'll want to increase the DO levels at the roots through the power of "true" hydroponics. True hydroponic systems use little or no

growing medium at all; the plant's root system is bathed in a highly oxygenated nutrient solution that flows over the roots, or which is applied as a spray or fog in the case of aeroponics and "fogoponics."

Deep-water culture (DWC) is another hydro system that can provide higher O₂ levels than most soils and soilless mixes. However, most DWC systems simply diffuse O₂ into the nutrient solution using an air pump, rather than dissolving oxygen into the solution like a small water-circulation pump can.

These days, there's a huge variety of plug-and-play hydroponic systems for cannabis growers at all levels; there is also a lot of information available on how to build your own. One of the advantages of using a "store-bought" system is that it's guaranteed to work, and it's often backed by (or at least discussed in) a high volume of customer reviews. Building your own might save you some money, but if it's constructed poorly, it can cost you a lot more in terms of safety—both for you and your garden!

In the end, if you want faster growth rates and better yields for your cannabis plants, remember to consider more than just the N-P-K ratio of your fertilizer. Keep in mind that your plants live in two different worlds at the same time, the root environment and the shoot environment, and that each of these must supply your plants with the solid-state and gaseous minerals they need to provide you, in turn, with the medicine you require. By giving your plants vital nutrients like CO₂ and O₂ along with fertilizers and additives in the right quantities and ratios (and at the right times), you can help them truly excel, unlocking their full genetic potential for your medicinal needs and recreational enjoyment. ✨

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PATENT PENDING

After a five-year hiatus, Faith Evans' artistry is soaring higher than ever.



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UNSHAKEABLE FAITH

INTERVIEW BY DAN SKYE

She's only 37 but has lived a lifetime. In fact, Faith Evans has already published her memoirs, *Keepin' the Faith* (Grand Central Publishing, 2008). She began her career as a back-up singer and became the first female artist signed to Sean "Diddy" Combs's record label, Bad Boy Entertainment. She's got four kids, has five top-selling albums behind her, and was dubbed "rap's most famous widow" following the murder of her husband, the Notorious B.I.G. Her tribute to him, "I'll Be Missing You," touched millions.

Now, after a five-year break from recording, she's back with a new album, *Something About Faith*. She's also filming a new reality show, *The First Ladies*, with Misa Hylton-Brim, the mother of Combs's oldest son, Justin. Evans has also been tapped to play Flo Ballard—one of the founding members of the Supremes, who died in 1976—in an upcoming film bio that starts shooting in a few weeks.

"It's just me going into businesswoman/entrepreneur mode," she laughs. "Just trying to make a dollar out of 15 cents."

She's nonstop busy, with kids between the ages of three and 17. But Faith still found time to sit down with HIGH TIMES and talk about church singing, the hip-hop world and her support for cannabis.

You grew up in a foster home. We often hear about the difficulty of living in foster homes, but you had a fairly positive upbringing.

I wasn't a foster child, like "in the system"—my grandparents raised me, but I was the first child they raised that wasn't theirs. Shortly thereafter, they started taking in foster children. What I mean is, I grew up, I guess, as a de facto foster child—but it was definitely a *family*; we all call each other "brothers" and "sisters" and "cousins" to this day. That's still my family. Definitely, it had its share of dysfunction, in terms of the things that you see with people coming from all different types of homes and situations. But my grandparents had a very strong faith and kept us in church and tried to go the right way and—the *love*. I think I got the things that I was supposed to get from it. I understand the bad side; I understand how it could be. It just gives me more of an appreciation as I grow older. It's helped me to understand people and to deal with them with compassion.

Why have so many great singers come out of church choirs? Is there a powerful vocal connection made in that setting?

Certainly so—I guess growing up in church, you make a certain spiritual connection with God. You're in a different place.

It's funny, because when I first started makin'

records, a lot of people who knew me from church when I was younger were like, "You're not singin' like you do in church." And I'm like, "I'm not in church—I'm makin' a record."

Some people in church choose to just kinda wail. But you have to have highs and lows. In church, mostly you're more in the spirit, and so is everyone else who is listenin'. It's a little bit different than trying to make a recording.

You were singing in church at the age of four. Did you make a spiritual connection at that age?

Initially, before I actually felt the spirit, I had a recognition of what my singing was doin' to the people that were listenin' in church. At that age, it's like—*wow!*

I knew that there was something special, but it took a couple of years for me to get over my fear, to actually feel okay when I'm singin', to feel the spirit and actually know what that feelin' was.

The atheism movement is growing in America. How do you view that?

To each his own—and, to be honest, my spirituality helps me to understand that. I continue to touch people, and that's only through the gift that God gave me, and the spirit He's given me beyond my musical talent.

I mean, I definitely grew up in the Christian

church, but over the years I learned that you don't even have to be in those four walls of the church. I learned more when I haven't been able to go to church every Sunday. If you believe in a higher power—and even if you don't, if you're consciously livin' and tryin' to do things the right way ... like I said in one of my songs: "If you're coming from the right place, you can't go wrong"—regardless of your religious preference or lack thereof.

Once you decided to sing professionally, what do you think made you stand out as a singer?

My personality is definitely good [laughing]. I mean, I have a real great sense of humor, and a lot of friends say I should be a comedian. I was shy for a very long time—even as an adult, in terms of how to infuse my singing with my personality. Now I'm at the point that, when I get on-stage, I feel a lot more comfortable.

Can you account for your durability as a top-selling recording artist?

I don't really have a theory. Number one, I'm certainly blessed—I know that it's a blessing to have a gift and be able to touch people. You never know how or who you touch; I'm constantly reminded of that. I don't take for granted that people know who I am or know my music or like my music. I just try and be the same me all the time.



'Medicinal use should be regarded as very important. There are plenty of people out there with different sicknesses that can be helped by using it.'

Do you get tired of being asked about the death of B.I.G.?

Oh, no, that's inevitable. I was so close to him. But at the same time, there was a time when it seemed like it was overshadowing my talent. There was a short period where I used to feel: "Are they talking to me because of him or because they like my music?"

But I understand, and I'm proud to have been a part of his life and to have known the force that was known as the Notorious B.I.G. He was a great guy, and his music—it's really good to see the legacy that he's left. Not only in his music, but, you know ... I'm raising his son.

How accurate were the descriptions of your part in the so-called "rap war" that killed B.I.G.?

I think what started was that people had personal gripes with one another, and it just kinda played out in the media. And as people started to gain more success, it became a lot *more* than just that.

The situation was perpetuated by even calling it a "rap war." But the part I played in it was minimal at best. First of all, I didn't see it as a rap war. That all came from the media—East Coast, West Coast. I was in a situation where I was actually just trying to get away from the drama that I was going through with B.I.G.

I had decided not to go on tour with the Bad Boy family. I came to California to get some money writin' songs—and I met Tupac Shakur at a club, and he wanted to do a song with me. Prior to this, I had never met Tupac. I knew that he and my ex-husband were good friends, so I called B.I.G. and told him I had met him. So if I was up to something, I definitely wouldn't have called him and told him

that [Tupac] wants me to do a song with him. Nobody told me "Don't do it!" either, mind you.

But after the studio, I knew that something felt strange in my spirit. Then, the next week, there you go: It was headlines that I'm having an affair with Tupac, when all I did was go and do a record and get some money—which I never did collect.

Take it as a lesson learned. I like to say I took a left jab on the chin in the name of hip-hop [laughing]. That's exactly what it is.

Tell us about the rap scene now. Some observers have said that it's dying.

I haven't been in the marketplace with music in five years, but I don't have a problem with the current state of music or hip-hop. As an artist, I have respect for anybody's creative interpretation. If you find an audience for it, then hats off! It's up to the audience to say what they like and don't like—and, obviously, a lot of people like this current crop of music. People are takin' advantage of different technological advances and fusing that with their artistic interpretation. Technology opened the window for people to get their stuff out there. I guess it seems like the market's flooded with a new sensation every other day—but, you know, I can't tell you that if I didn't have a record deal and I was a new artist, I wouldn't be trying to use those outlets, too [laughter].

You released your new album, *Something About Faith*, independently. How was that?

The album actually was released in October—unfortunately, that's one of the downsides of doing an entertainment deal without the extra marketing machine. It's my first album on my own; that's es-

entially what is most special about it—to be completely in the driver's seat, to own my masters, to have the right to do what I want to do with it. If the relationship with the people out in the business doesn't work out—or even if it does—I still can do what I like, as opposed to someone else making money off of what I put my heart and soul into.

There's an old saying: "If you work for yourself, you've got the toughest boss of all." Is there a lot of pressure as an independent artist?

Not really. I've always been pretty hands-on, especially creatively, in the studio—trying to make sure everyone's splits are correct. The only thing is that, administratively, on the label's side, I've learned over the years that they don't always turn in what you thought in terms of your splits.

So now it's a win-win situation: If anything is wrong, it's very few people that you have to look at to find who the problem is. It's just made for a better process creatively without the middlemen and all the extra stuff and 50 other opinions.

Did you have any reaction to Prop. 19's failure to pass in California?

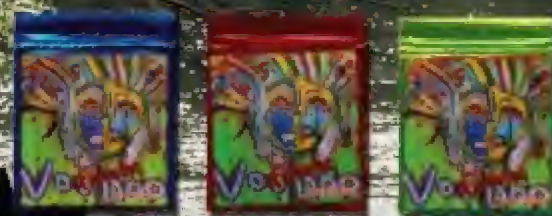
I voted and I did vote "yes," because I feel if you're of age, you should have that option. Obviously, the government hasn't quite got it together, but I'm sure it will be coming soon. Medicinal use should be regarded as very important. There are plenty of people out there with different sicknesses that can be helped by using it. Why shouldn't they be able to acquire it? They're selling all these new drugs, but they're gonna mess up your liver and your heart. This is probably the closest to a natural remedy, you know, that you're going to find.

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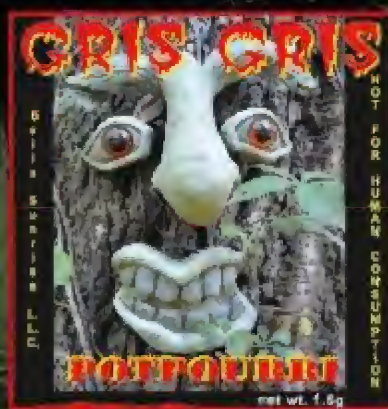
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the high times interview



Faith Evans and El DeBarge arrive at the 2nd Annual Soul Train Awards in Atlanta.

As a vocal artist, does cannabis bother your voice? I've never liked to smoke right before I sing. I usually gargle with salt and hot water. Smoking, period, dries out your voice—smoking *anything* dries your vocal cords.

I have definitely smoked recreationally. I never even tried it until I was an adult, after my first child was born. A friend of mine used to smoke, and I would be sittin' in the car with him goin' to wherever we were goin'. He asked me to try it, and I didn't feel anything. After that, it probably wasn't until I moved to California [laughter]. I didn't even know what I was supposed to feel, but then I started choking and—*wow, okay*. That's when I knew how it was supposed to feel.

When I was heavily into working out a few years back, I'd smoke before I worked out. To be honest, I would go and work out for two hours, sometimes twice a day, because it made me feel like I wasn't really focused on anything else.

Back in 2004, you were busted for pot and went to rehab. Tell us about that experience.

That actually was widely misreported, because I certainly didn't go to rehab. It was not that serious: They found a half-joint in a cigarette case in my husband's luggage. We actually went to what was called a "spiritual diversion program," where you go a few times and get different religious literature or have to watch a video. You basically write what you got from it. I grew up in church, so I already knew what I was gonna write—I already knew the answer before they asked me the question [laughter]. We only really ended up doing that two or three times before they actually threw the whole thing away.

It was also reported that the cops found a crack pipe.

No, just a half-joint. It's funny, because my kids the other day found something online: "Faith Evans looks great. She must be off the crack, right?" So when I got home, they were like, "Mom, congratulations!"

I say, "For what?"
 "You're off the crack!"

Then they started laughing, and Michael and CJ were like, "It's so funny, because if you weren't our mom, we would think that's so sad."

They know me. Sometimes I'm asked how does it affect my kids when things happen and it's in the news. And I'm like, "They know their mother." They know exactly who I am—I can take pride in that, if nothing else. What other people think of me is none of my business, especially if they don't know me. What can I do?

I was actually very well prepared for that part of life way before the music business. My mom is very no-nonsense—great, sweet lady, but she's like, "*Bump* them! If you didn't do it, then don't worry about it. What the hell are you worried about? Did you do it? Well, *bump* them!"

Luckily, I've always had that in my mind. I never really worry about what people say, because if you don't know me, there's no way you're going to ever know all the details. I cannot really let that affect me.

How do you talk about pot with your kids?

I think that my husband and I do a pretty good job of kind of givin' them the real; they're not super-sheltered children at all. I think that when they're of age, I would certainly hope they've taken all the information that we've given them. All I can really do is hope that they're doing things responsibly.

More than anything, I want to teach them to treat people the way they want to be treated. I think my kids are pretty grounded, pretty well rounded considering that their mom is in the business and was a part of Puff's life and B.I.G.'s life. They see how I operate, so I think they have a pretty good example. Number one, if you achieve a certain level of success in whatever walk of life, in whatever career path, stay humble and you will continue to get your blessings. You can't just be reckless and be someone who doesn't have a heart. ✨

For more on Faith go to:

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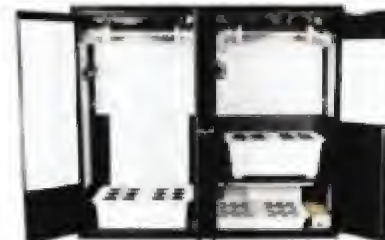
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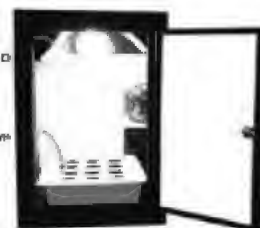


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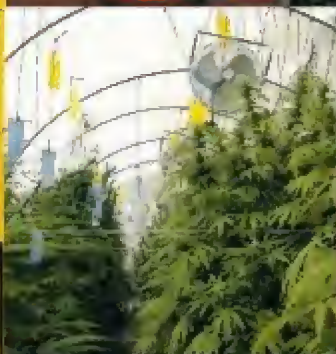
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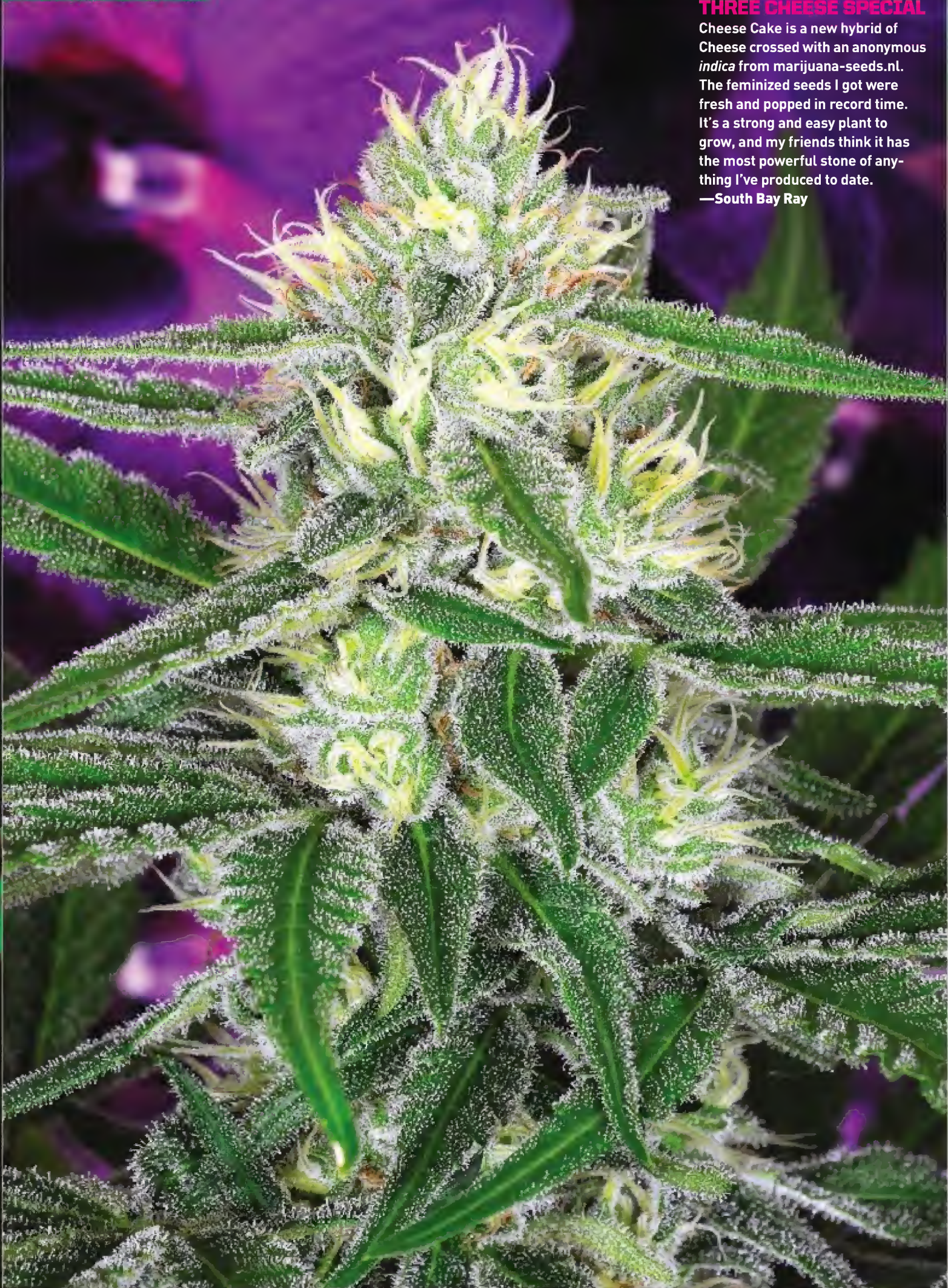
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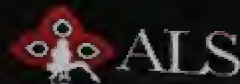
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Here's a photo of Nevil's Haze from Mr. Nice Seeds. Harvested at 14-plus weeks of bloom cycle, this is the shit! Bio-organically grown indoors in Vermont, the Green Mountain State.—Shovelhandle in Swanton, VT



DIRT FARMER (above and left)

Here are some pics of my medical grow with Purple Urkel and Blue Dream. Organic in soil is the best way to grow!—Travis Morgan



THE USUAL SUSPECTS (left)

I've had a lot of people I know tell me to submit my nug shots to you guys. I love HIGH TIMES—to this day it's the only magazine I still read. I've gathered five strains and shot them for you guys; if you do print them, I will forever be grateful, and that's coming from one stoner to another. The nugs, from left to right, are Jack Herer, OG Kush, Blue Dream, Fireball OG and Purple Kush. Enjoy!—Texas-Doja

Pix of the Crop is reader-driven. Your submissions make all the stoners of the world dream of kind nugs. Send pictures (no Polaroids), tips, questions and stories to: HIGH TIMES, 419 Park Avenue South, 16th floor, New York, NY 10016. Digital photos can be e-mailed to mailbag@hightimes.com and must be hi-res for publication. Remember, by submitting photograph(s) you thereby grant permission to the publisher to reprint photograph(s) in HIGH TIMES, as well as in any other Trans-High Corp. publication.



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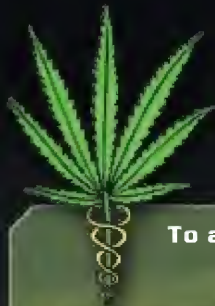
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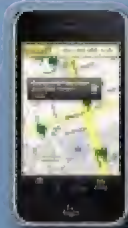


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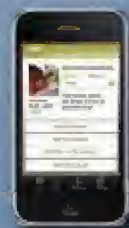
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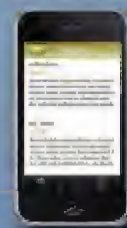
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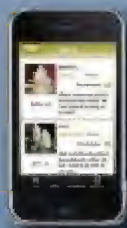
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RESTORING DRUG POLICY SANITY

In the thick of the Rally to Restore Sanity and/or Fear in Washington, DC. By Joe Morris

"We're not getting on this train," I predicted for the third Metro train in a row. It was impossible to board any of the trains heading for the National Mall on the morning of Jon Stewart and Stephen Colbert's event. The rally's organizers had reached out to Students for Sensible Drug Policy as a group with a message "in line with the theme of sanity" and offered us 50 "special guest" tickets for our members.

Thankfully, when we finally did manage to get there, we found that only a few thousand people were in the special-guest area, so in comparison to the rest of the Mall, it was luxuriously wide open. We could see the stage and even had room to breathe and move around, while all those people without special-guest status were pressed up against the fences all around us. I'm so grateful that we had a chance to enjoy the rally from such a standpoint.

We had coordinated with the Drug Policy Alliance and other groups to form a "Rally to Restore (Drug-Policy) Sanity" contingent, which showed up in full force with hundreds of "Legalize Pot" signs that depicted Jon Stewart holding just such a sign during his announcement of the rally. Signs and stickers proclaiming "Yes on 19" in blue and green sprouted up like mushrooms throughout the crowd.

As a student at American University this past fall, I've been privileged to serve the drug-policy reform



Joe Morris

movement in some small capacity as an intern with SSDP. Although I'm hardly the most important cog in this grassroots machine, I'm delighted to have helped point the world towards a freer and more peaceful future.

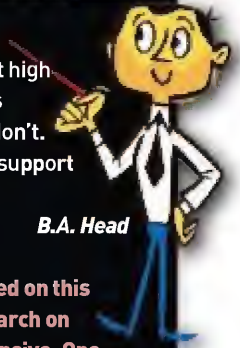
SSDP had a lot of work to do organizing the "Phonebank for Sanity" event that was scheduled in our DC office immediately after the rally. I hate talking on phones, so my goal—like Tom Sawyer and the whitewashed fence—is to get other people to do it instead. Taping boxes shut, rearranging various electronics and tables, taking out the trash—it was all in the day's work. Finally, we had dozens of

motivated individuals my age spread across the office couch and betwixt various computers calling voters just days before the California elections and reciting their outreach script: "Hi, my name is ____, I'm calling about Proposition 19, the initiative to tax and regulate marijuana, have you heard about it?" And even though Prop. 19 went down to defeat, our efforts have laid the groundwork for next time.

So if you ever have an opportunity to intern for SSDP or another drug-policy reform organization, I highly recommend it. It's been a great experience for me, and the chance to attend this historic rally as part of the drug-policy reform movement was just the icing on the (space) cake. ✨

Joe Morris is an intern at SSDP's DC headquarters.

ask dr. mitch



Dr. Mitch,
I feel like people who get high together become friends faster than people who don't. Is there any research to support this idea?

B.A. Head

Hi B.A.,
There's nothing published on this exact topic, but the research on friendship is pretty extensive. One related finding shows that two people who laugh a lot together when they first meet claim to feel closer afterwards. Perhaps the plant facilitates friendship via laughter. I also think that we tend to pick people we already like when it comes time to share the stash.

I've heard that President Nixon blamed all of the legalization efforts back then on the Jews. Are Jews arrested more for marijuana than other people?

H.H.

Hi Double H,
Most arrest records don't report an arrestee's religion, so we don't know. But I do think that Ethan Nadelmann and Marsha Rosenbaum of the Drug Policy Alliance, medical patient Irvin Rosenfeld, outspoken activist Brett Stone and my own humble self would have found an interesting place in Nixon's paranoia.

I'm up against prohibitionists who say, "More crazy people smoke pot, so pot must make them crazy." I know this is wrong, but I need some examples to help explain it.

Free C.

Hi Free,
People confuse correlations for causes all the time. As the number of churches in a city goes up, so does the crime rate—but that doesn't mean churches cause crime. Mentally ill people are more likely to smoke cigarettes; do your prohibitionist opponents think that cigarettes cause mental illness? Finally, college-educated people are more likely to have tried marijuana than their same-age peers who never finished high school. Does that mean that marijuana is the key to a college education? Obviously, just because two things happen in a particular sequence doesn't mean that one caused the other.

Dr. Mitch Earleywine, Ph.D., is an associate professor of psychology at SUNY Albany. He is the author of Understanding Marijuana and The Parents' Guide to Marijuana. Got a question for Dr. Mitch? Email him at 420research@gmail.com.

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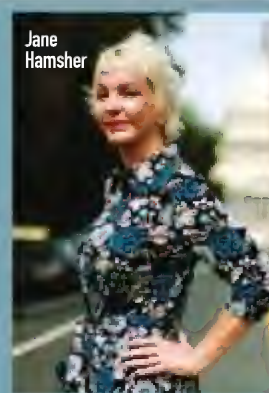
Jane Hamsher tells progressives to Just Say Now!

California's Proposition 19 to legalize marijuana didn't pass last November, but it *did* succeed in advancing the cause of legalization. And one of the most important victories of that campaign was the forging of a broad new coalition to end prohibition, one that now includes civil rights groups like the California NAACP, the Latino Voters League, and the Progressive Jewish Alliance; law enforcement groups like the Black Police Association and the Latino Officers Association; and labor unions like SEIU and UFCW.

These important new allies might not have joined our cause if not for the work of this month's Freedom Fighter, Jane Hamsher, founder of the influential progressive blog firedoglake.com. Legalization has long been a popular topic in the progressive blogosphere, but one that had been largely taken for granted, rarely meriting the "serious" attention afforded issues like health care, the economy, and immigration. Hamsher, however, recognized that the drug war impacts nearly every issue her progressive readers found important. So in April 2010 she took a poll, and found 92 to 97 percent of her readers wanted firedoglake.com actively involved in legalization efforts.

By April 20, also known as "cannabis day," the "Just Say Now" project officially launched. Teaming up with Students for Sensible Drug Policy, firedoglake.com was instrumental not only in gaining endorsements and generating positive media coverage, but also in get-out-the-vote activities that elevated the legalization discussion from the pipe dreams of college students and aging hippies to a mainstream political issue.—Russ Belville

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Jane Hamsher

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For the stoner on the go. By Ashley Boudreaux

Something's wrong with my heart and my front passenger wheel. Both have been rattling in an alarming fashion of late, and I'm starting to wonder if I'm driving myself a little too hard. I have three super-cool jobs, believe strongly in real butter, drink coffee at ungodly hours of the night, and spend far too much time careening wildly down Third World roads. So if the wheels fall off, I guess I only have myself to blame.

My mechanic says that it might be my bearings; my doctor swears that it's anxiety. But I haven't lost my bearings, nor am I particularly anxious about anything. Yes, I live life in fifth gear. Oh fucking well—I like adrenaline, I like being on the front lines of life, and if I could avoid sleeping altogether, I would. There's simply too much to do, and I want to cram it all in before the Great Creator turns my corporeal carriage into a pumpkin. I've been an insomniac since kindergarten; I was always afraid that I'd miss something cool if I slept through the night.

So I don't want to slow down—I just want more hours in every day. You hear me up there, Big Man? Get on that, would ya? I'm not getting any younger down here, and I have a lot to do. I have unjust drug laws to rail against, exotic countries to visit, art to savor, wine to drink, weed to smoke, and stages to build so that musicians can find those moments of harmonious perfection that make my hair stand on end. I have a teenage theatrical-lighting prodigy to rear and a demanding cat to placate (and eventually name, I suppose) and oh my God I really need a manicure, because patching audio for that rock festival last week was NOT kind to my nails. My poor neglected nails. How is a woman to be taken seriously when her nails look like this? It's just wretched, I tell you. *Wretched.*

And my husband wants another kid. Seriously? Can't we just *borrow* one every once in a while? That would free up a lot of time to do things like spelunking in Budapest and rolling around in a barge full of ganja in Jamaica—both of which I've been invited to do. But it doesn't work like that, does it? No. So either I'll eventually relinquish my husband to some young, vapid, fertile thing whose eyes I'll want to claw out, or I'll pump out another puppy soon, strap it to my chest in one of those Snugli apparatuses and drag it all over God's creation like I did the last one. And let's ask my progeny how that worked out for him

"Fuck off, Mom—you scarred me for life with a diet of ramen noodles, you smoke too much pot, and your friends are stinky hippies. And by the way, I'm a Republican."

Good to know.

So there it is: my hectic life. If only I could have a couple of clones. Clones would be good, I think, unless my husband tried to sleep with them—because, really, how do you draw the line there? Maybe a male personal assistant



Mota mocha.

would be more feasible. Preference would be given to hippies with experience in car repair and cardiology who are willing to work solely for marijuana and good coffee. Anyone out there fit that description? ✨

ICED GANJACHINO

(Inspirational credit goes to Dave, who studied wood sculpture with Native Americans on the West Coast and drank way too much coffee in the process.)

- 1 cup coconut oil
- 5 grams fine ganja shake (preferably *sativa*)
- ¼ cup sugar
- 2 tsp real vanilla extract
- 1 package unflavored gelatin
- 10 oz espresso, chilled
- ½ cup chocolate syrup
- Half-and-half
- Ice
- Chocolate shavings to garnish

In a small double-boiler, heat the coconut oil to liquid form. Add the ganja shake. Simmer on low for 40 minutes. Strain, then squeeze the remaining coconut oil from the ganja. Add sugar and vanilla, then blend with a hand mixer or blender. Put the oil/sugar mixture in the fridge until it hardens again. If it doesn't harden successfully, add a package of unflavored gelatin, then mix or blend it again before returning it to the fridge.

Combine the espresso, chocolate syrup and half-and-half in a bar shaker. Shake well and pour over ice. Top with the ganja whipped cream and sprinkle with chocolate shavings.

Now you can go until the wheels fall off!

Stones four.

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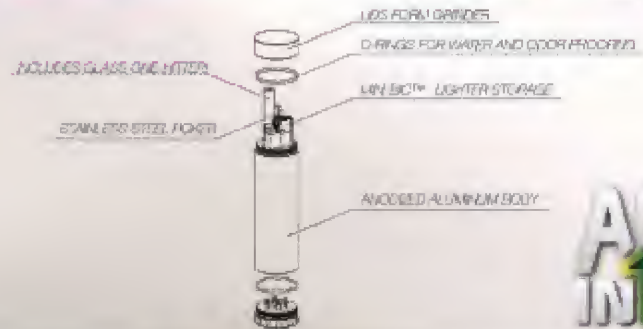
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Despite passionate activism, Prop 19 failed to pass.

WISING UP

Learning the lessons of California's Proposition 19.

Despite falling short—54 to 46 percent—on Election Day, California's historic Regulate, Control and Tax Cannabis Act of 2010 (better known as Prop. 19) came closer than any effort in history to legalizing cannabis for all adults. It also helped push our movement forward in five distinct ways:

1) Prop. 19 helped launch a nationwide discussion and debate about legalizing cannabis that will continue when states like Colorado, Washington and Oregon launch their legalization initiatives in 2011 or 2012 (as well as when Californians vote on legalizing cannabis again in the future).

2) Law reformers made great strides in cannabis coalition building, with major unions, civil-rights groups, Democrats and former law-enforcement officials finally coming on board to support an end to prohibition.

3) Prop. 19 inspired a number of young multibillionaires to step out of their smoky closets and acknowledge their stakeholderhood in cannabis-law reform, primarily by making large financial donations and supportive public statements. Also, it was the "ganjapreneurs" and cannabis-businesses of Oakland who launched this initiative, rather than the marijuana-law reform groups that have traditionally raised the "big money" required to run pro-reform initiatives.

4) Every major newspaper in California came out against Prop. 19, but they did so while at the same time acknowledging the failure of cannabis prohibition and the need for basic reforms.

5) While opponents of Prop. 19 chiefly attacked the "how" of legalization, albeit with made-up or distorted concerns (e.g., cannabis being used in the workplace, increased incidents of driving while impaired, the use of cannabis in front of children), the great public debate in California bypassed, for the most part, the old Reefer Madness claims of cannabis being a "gateway" drug that causes amo-

tivational syndrome, criminality or addiction.

So what were NORML's top 10 lessons learned from Prop. 19?

1) Reformers need to make clear that legalization enhances, not detracts, from patient access to cannabis as a medicine.

2) People from 18 to 25 years of age make up the biggest group of stakeholders in this struggle, and we can't overpenalize them to appease our opponents.

3) We must find ways to integrate current illegal growers into a new legalized market.

4) We won't win until people are more scared of cannabis prohibition than they are of legalization.

5) We must stop painting cannabis as a bad thing that needs to be highly controlled.

6) We have to be realistic about what legalization can and cannot accomplish.

7) We need to legalize cannabis first and then deal with secondary issues like drug testing later.

8) We can't treat cannabis like alcohol unless we have roadside tests like we have for alcohol.

9) We can't commercialize cannabis cultivation and sales without consistent statewide regulations.

10) We must recognize that medical cannabis has reached its political peak and is now inextricably linked to the overall legalization effort.

—Allen St. Pierre and Russ Belville

Allen St. Pierre is the executive director of NORML, and Russ Belville is NORML's national outreach coordinator. The above was adopted from a more comprehensive NORML blog post available at blog.norml.org/prop19lessons/.

ALABAMA

Alan R. Elledge, Attorney at Law

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Stephen W. Dillon

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email: mikearnett1@juno.com

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TEXAS

Johnathan Ball, Attorney-at-Law
1115 Cardinal Ave.
McAllen, Texas 78504
(956) 501-6565 Phone
john@johnballattorney.com
www.mcallendruglawyer.com

Jeff Blackburn
718 W 16th
Amarillo, TX 79101
Phone: 806-371-8333
Fax: 806-350-7716
blackburn@wtinnocence.org

Greg Gladden
3017 Houston Ave.
Houston, TX 77009-6734
713-880-0333
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Gerald Goldstein
2900 Tower Life Bldg.
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210-226-1463
GGandH@aol.com

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Welcome to our mini-section devoted wholly to medicinal strains, news, uses, developments, activism, politics ... everything and anything, really, that is medically related to marijuana. This is your *Cannabis Clinic!*

New Links Discovered Between Cannabis and Treating Breast Cancer

Mary Jane Borden of DrugSense/MAP recently published one of the most compelling arguments not only for the medicinal use of cannabis, but also for its legalization as a whole. Citing scientific evidence of the links between cannabinoids, human endocannabinoids and the CB receptors in our bodies, Borden highlights the therapeutic properties of this miracle plant in the fight against breast cancer—one of the commonest forms of cancer, and also one of the deadliest. Each year, one in eight women will be diagnosed with breast cancer, and nearly 40,000 women will die from it—a staggering number that points up the urgent need to have all options explored in our search for a cure.

Before we deal with the biology behind these links, it's important to understand that, although we've made great strides in treating breast cancer, the treatments themselves are severely toxic and can cause horrendous side effects—not to mention also possibly kill the patients themselves. It's for these reasons that the scientific studies involving cannabis, and especially the cannabinoid known as cannabidiol (CBD), are so important.

In her article, Borden explains that the research into treating cancer with cannabis begins with the human body's own internal systems. The body creates neurotransmitters called endocannabinoids that are very similar in structure to the cannabinoids found in marijuana. The body also creates cannabinoid receptors to receive these transmitters; these so-called CB receptors are located in cell membranes throughout the body and can be activated by our own endocannabinoids as well as those that come from the cannabis plant, such as THC, CBD and CBN. Endocannabinoids have been produced in humans since the dawn of our species, and they've been found to regulate numerous essential processes such as appetite, pain and even the creation of new brain cells.

The latest research shows that these cannabinoids can play a mitigating role in breast cancer as well. Based on a study published in *Molecular Cancer Therapeutics*, Borden states that CB receptors can be used to



Cannabis Cup winner, Lavender, from Soma Sacred Seeds.

Medicinal Strain of the Month: Lavender

This month we bring you an exclusive excerpt from Danny Danko's new book, The Official HIGH TIMES Field Guide to Marijuana Strains. In it, Danny covers over 125 varieties with detailed reports such as the one below on Lavender, featured as this month's medicinal strain. The Official HIGH TIMES Field Guide to Marijuana Strains is due in bookstores in January 2011.

Lavender - Soma Sacred Seeds

1st Place HIGH TIMES Cannabis Cup *Indica*, 2005

Lavender is one of the all-time-best mellow, violet-colored, *indica*-dominant strains available to the public today. By the time she's finished flowering, the leaves will have turned a super-dark purple bordering on black, with bright orange veins running throughout. Dense, waxy nuggets of Lavender are a photographer's dream, and she exhibits beautiful fall foliage when ripe. The taste is of plum and pomegranate, well balanced by the hashy afternotes. A dry toke will also reveal hints of an anise or licorice backend.

Lavender plants stretch a bit more than the average *indica*, so be prepared. Her relaxing and sedative high can be a bit much for the unsuspecting toker, but Soma says it's a perfect nighttime or rainy-day smoke, though not recommended for use at parties or prior to activities. For this reason, medical patients looking for help with insomnia should try some Lavender for evening relief.

Lineage: Super Skunk x Big Skunk Korean x Afghani/Hawaiian

Flowering time: 8 to 9 weeks

Contact: Soma Sacred Seeds, somaseeds.nl

develop new therapeutic solutions against breast-cancer growth and metastasis (the spread of cancer cells to other parts of the body). An article in the journal *Molecular Cancer* supports this claim, stating: "These results provide strong preclinical evidence for the use of cannabinoid-based therapies for the management of ErbB2-positive breast cancer." And remember: This is with *zero* negative side effects, especially compared with heavy radiation and chemotherapy.

Borden also makes an excellent point about the absurd stigma that cannabis still carries with it today, which might be preventing extra funding for research on what has always been one of the world's most miraculous, medicinal

and healing plants. Borden pointedly asks what would happen if a scientist or doctor discovered cannabis today: Would the world's governments react in the same way? It's an excellent question, and one that really forces every one of us to question how, why and where we went wrong—and, more importantly, what we can do to correct it now. ✨

Special thanks to Mary Jane Borden for her excellent report. To read her complete article, go to alternet.org. Check out pubmed.gov as well.

Got medical questions? Pass 'em over to Nico at nico@hightimes.com.

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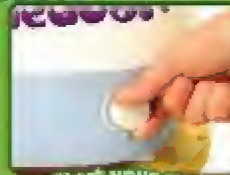
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Growing strong cannabis plants requires understanding the various mediums that hold roots in place, allowing air and food to reach the vital root zone.

Story and photos by Herb Spadowski, Ph.D.

Healthy plants at harvesttime require proper conditions in the medium, and strong roots.

pHIGURING OUT pH

Part 2, Soil Components

Substrates

In Part 1 of “pHiguring Out pH,” we discussed all the problems that can occur when soil pH is too high or too low. Part 2 of this series will discuss most of your options for growing substrates and how each of the ingredients affects pH. Remember that pH is the inverse relationship between the concentration of H⁺ (acid) and the pH value. When the pH is below 7, there’s more acid in the system; when the pH is above 7, the system is more alkaline or basic.

Outdoor Soils

Soil is defined as the finely textured material on the surface of the Earth that is composed of minerals, organic matter, liquids and gases, and which has the ability to support plant roots. Thus, the material that you buy in a bag at your local garden center or grow shop is *not* soil; it’s actually a soilless substrate or growing medium. While soil can be a component of substrate, this is typically not the case. Soil needs to be pasteurized with heat or steam to kill noxious weed seeds and pathogens before it can be safely added to substrate. Also, soil is very dense and compacts tightly when in a container, which reduces aeration and water movement. Additionally, soil adds excess weight to substrates, making them costly to ship. For all of these reasons, soil is rarely a component in store-bought substrate mixes. However, if pasteurized soil is available, using it as a component of your substrate can increase its nutrient-holding and pH-buffering capacities.

When you’re growing a crop outdoors, using the native ground soil is cheap, convenient and likely the best option. Only in rare cases when the soil

is in very poor condition would a grower bring in his or her own substrate. In order to determine if your soil is in good condition and has the proper pH, a soil test must be performed. To do this, several samples should be taken from the growing area. It’s best to take them in a zigzag pattern across the entire area from the soil surface to a depth of 6 inches. Collect at least 15 samples from your growing area and then combine them into one sample. After the sample is thoroughly mixed, take a subsample of about a pint and deliver or mail it to a local soil lab.

The test results should indicate what problems (if any) you have with your soil, and you should make your amendments based on these results. For example, if the soil pH is too low, limestone should be applied. Table 1 lists the amount of lime to apply to different soil types to reach a pH of 6.0, the optimum value for cannabis production in field soils. Lime should be incorporated into the soil to a depth of 6 inches; it may take a few months to increase the pH to the target value, so it’s best to take a soil test several months before planting your crop.

Table 1. Pounds of limestone required per 1,000 square feet to raise three types of field soils to the optimal pH of 6.0

Measured pH	Clay Soil	Loam Soil	Sandy Soil
4.0	19	13	5
4.5	15	11	4
5.0	11	8	3
5.5	6	4	1

A compost pile breaks down leaves, food scraps and other organic materials into a useful soil amendment.



Humic additives improve plant strength and add essential minerals to your medium.



Figure 1. Six commonly used substrate ingredients.

Table 2.
Dr. Spadowski's Custom Cannabis Substrate Mix

Ingredient	Percent
Peat moss	60%
Perlite or rice hulls	20%
Compost	10%
Vermiculite	10%

*4 to 8 lbs of limestone per cubic yard of substrate will need to be added to achieve a pH of 5.8 to 6.4.

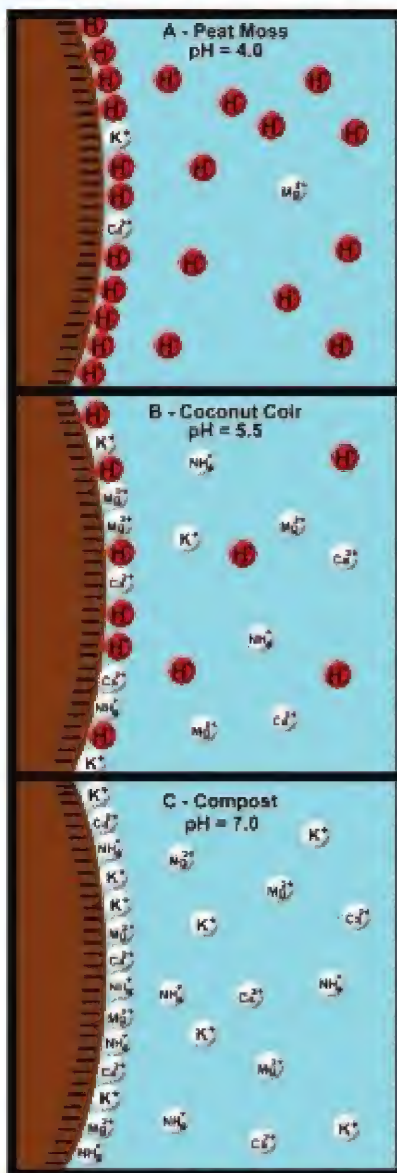


Figure 2. Box A represents unlimed peat moss with a pH of 4.0. Here, most of the negative charges on the surface of the peat are occupied by acidic H^+ ions, with a few sites occupied by nutrient ions (Ca^{2+} , Mg^{2+} , K^+ or NH_4^+). There is also a large number of acidic H^+ ions in the solution surrounding the substrate particles. Most of this acid needs to be neutralized by limestone in order to make the peat suitable for cannabis production.

Box B represents coconut coir, which is less acid than peat moss and has more nutrient ions. Thus, this substrate component requires less lime than peat moss to neutralize most of its acidity. Box C is compost, which has the highest inherent pH of the three substrate components shown here. There is zero acidity, and the compost is heavily loaded with nutrient ions. Thus, the opposite needs to occur here in order to optimize pH: The compost should be mixed with an acidic ingredient, such as peat moss or pine bark, to reduce the pH and dilute the nutrient concentration.

Soiless Substrates

As mentioned earlier, nearly all commercial and store-bought substrates contain zero soil. These substrates typically include several of the following ingredients: peat moss, pine bark, coconut coir, compost, vermiculite, perlite and, more recently, rice hulls (Figure 1). Each of these ingredients has different chemical properties and needs to be treated differently to adjust the pH and prepare for the production of high-quality cannabis.

All of these products—with the exception of perlite—have some amount of negative charges along their surface, which attract and hold positively charged ions such as ammonium (NH_4^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}) and the acid ion, hydrogen (H^+). The negatively charged surface sites are always occupied by positive ions, and the proportion of these that are acid or H^+ ions dictates the pH and, thus, the amount of lime required to adjust the pH to a suitable level for cannabis production (Figure 2). This is why understanding the chemical differences between substrate ingredients can help cannabis growers decide which mixes will work best for them and which ingredients they may want to use to amend their substrate or soil.

Peat Moss

Peat is the most commonly used substrate ingredient. Most of the peat sold in the US is harvested from peat bogs in Canada. Peat is very popular because it decays slowly, is very porous and has a high water-holding capacity; it's also a consistent and reliable product. The inherent pH of peat moss is 3.0 to 4.0, which is the lowest pH of the common substrate ingredients. For this reason, peat requires 5 to 10 pounds of lime per cubic yard. The addition of lime will increase the substrate pH to the ideal range for cannabis production: 5.8 to 6.4. If the pH of your field soil is too high, amending it with pure unlimed peat moss can be a good way to lower the soil's pH.

Pine Bark

This product is the second-most-popular ingredient for soiless substrates and is a byproduct of the timber industry. Chemically, pine bark is very similar to peat moss, with a low inherent pH of 4.0 to 5.0. As a result, pine bark also requires 5 to 10 pounds of lime per cubic yard to raise the pH to an acceptable level.

Coconut Coir

Sometimes referred to as coir, coco or coco peat, this is a byproduct of the coconut industry and comes from the coconut's outer layer. Since most coconuts are produced near the ocean, coconut coir is washed to remove unwanted salts before it is packaged. The inherent pH of coconut coir is 5.0 to 6.5, so it may not need lime to adjust the pH to an acceptable level.

Compost

Chemically speaking, compost is much different from the three substrate ingredients discussed above. Compost generally has a much heavier nutrient load, and its inherent pH normally ranges from 6.0 to 8.0. For these reasons, pure compost should never be used to produce cannabis (Figure 3). As a rule of thumb, compost shouldn't exceed 30% in soiless substrates; if it does, the pH and nutrient load can both be too high. Using compost with another acidic substrate ingredient, such as peat, will help increase the pH of the mixture to an acceptable level and provide nutrients to your plants (not enough nutrients to get you through the entire crop, but it will offset some of your fertilizer needs). An added bonus of using compost is beneficial microorganisms: High-quality compost that was aerobically produced contains a plethora of desirable bacteria and fungi. These microbes protect your plants' roots from diseases by preventing unwanted microbes from becoming established.



Figure 3. Chlorosis and necrosis on cannabis leaves caused by high salts, which can occur when using too much compost.



Mixing together your ingredients in a large kiddie pool makes it easier and less messy than smaller containers.

A Side Note on Compost

Keep in mind that all composts are *not* created equal. Compost can be produced in a number of ways and from an endless variety of organic products. Compost should never have a vinegary, sour or foul smell; this indicates that the compost may not be mature or that it was produced anaerobically and may contain harmful microorganisms and/or chemical byproducts.

When trying a compost for the first time or from a new source, test it on a few plants. You can also try a seed germination test by putting a known amount of seeds in a few pots with soilless substrate on the bottom and a half-inch layer of compost on top. Then put the same number of seeds in a wet paper towel and place that in a plastic bag. After one to two weeks, approximately the same number of seeds should have germinated in both situations. Let the ones in the pot grow out to make sure they continue to look healthy.

Vermiculite

This is an inorganic product created by super-heating mica ore mined from the earth. The mica ore is crushed into small particles and heated so that the particles swell like an accordion being stretched out (Figure 1). The finished product is very lightweight, with expanded layers that improve the water- and nutrient-holding capacity of a soilless substrate. Vermiculite has a neutral pH of 7.0 and may even be slightly alkaline. It's normally used in small amounts in soilless substrate, so its effect on pH is minimal.

Perlite

Perlite is another inorganic product mined from the earth and expanded through a heating process. When perlite expands, it contains numerous sealed air pockets that make it very light. The finished product is white (Figure 1) and used in substrates for drainage or as a lightweight replacement for sand. Perlite is essentially inert and has no effect on substrate pH.

Rice Hulls

Also known as parboiled rice hulls, these are a byproduct of the rice industry (Figure 1) and relatively new as a substrate ingredient. They're used as an alternative to perlite and have an inherent pH of 7.0 to 7.5, but rice hulls are used in such small quantities that their effect on substrate pH is negligible. If you're planning to use rice hulls, however, make sure they're intact and not composted rice hulls, which have a much finer texture and are not suitable for use as a perlite replacement.

Substrate Formulations

There seems to be an endless supply of choices when it comes to bagged substrate mixes. Many of these are excellent for growing cannabis and initially don't require any amendments to optimize pH. However, during cannabis production, fertilization, irrigation and other cultural practices can cause the substrate pH to shift; this is when an amendment may be necessary. By blending your own substrate, you can "preprogram" it to better handle the pH shifts specific to your operation. For example, if your substrate pH always seems to increase over time, you can boost the amount of peat in your substrate by 10% before you plant. The resulting peat-amended substrate will have a slightly lower pH, reducing the chances that your plants will develop the problems that come with a high pH.

By formulating your own custom-made substrates, you can cater the mix to meet your growing needs. Additionally, making custom blends gives you the opportunity to continually fine-tune your mix to optimize production, and it may also reduce costs if you buy your ingredients in bulk. Dr. Spadowski recommends starting out with the recipe in Table 2. Look for Part 3 of "pHing Out pH" (coming soon) to learn how your fertilization program affects your soil/substrate pH.

Until then, happy growing! 🌿



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BY DANNY DANKO AND FELIX GREEN



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The upgraded HM Digital PH-200 is ideal for all the pH testing that conscientious cannabis growers have to do. It comes calibrated from the factory for three settings (4.0, 7.0 and 10.0 pH), with a measurement range from 0 to 14. It also simultaneously displays the temperature of the water you're testing, since temps have an effect on the pH of your reservoir/mixture (cooler temps = lower pH, warmer temps = higher pH). The new PH-200 also has a data-hold function that allows it to remember previous settings.

HM Digital's **COM-100 TDS** (for measuring total dissolved solids) is another upgraded model, this time with an expanded measurement range of 0 to 8,560 ppm. It also takes readings in four scales (μ S, mS and ppt as well as ppm). Like the PH-200, this meter comes calibrated from the factory, has a digital calibration to any point within the meter's range, and will also read the temperature of your solution.

Price: PH-200, \$79.95; COM-100 TDS, \$79.95

Contact: HM Digital, 800-383-2777, tdsmeter.com



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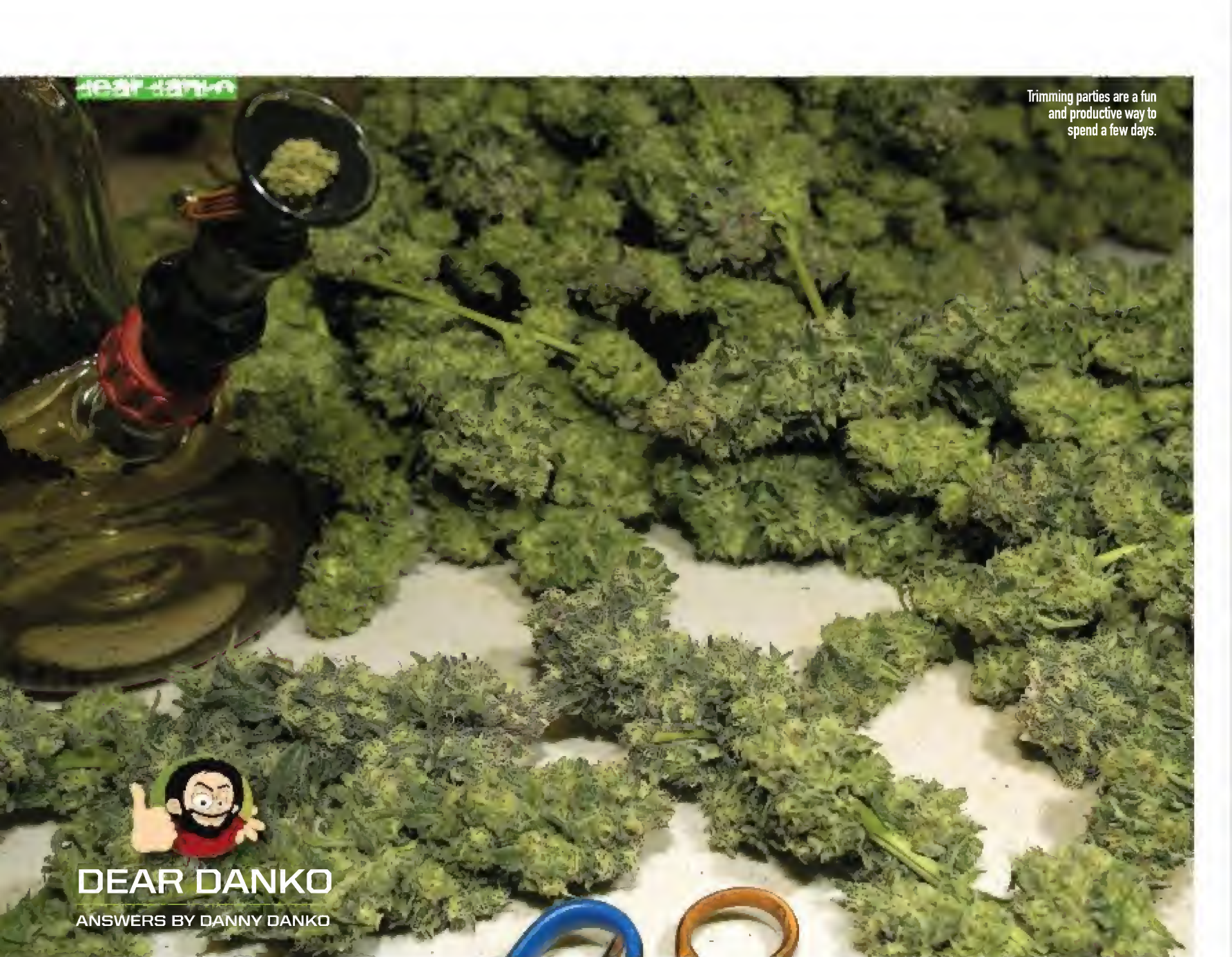
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Trimming parties are a fun and productive way to spend a few days.

DEAR DANKO

ANSWERS BY DANNY DANKO

TOPPING OFF

I have a 6' x 3' x 3' growroom, and one of my *sativas* is getting way too tall. I never topped it off because I thought I'd be okay, but clearly things are coming to a head. She's two weeks into flowering and only about 6 inches from my grow light. I'm afraid the tops will start burning any day now, but the buds are too beautiful to top off! Any suggestions? Thanks!

JackD

Dear Jack,

You do have alternatives to cutting off your beautiful buds while they're still forming. At only two weeks of flowering, you can carefully bend the branches below your tops to try to keep them far enough from the light so that they don't burn. The famous Amsterdam grower and breeder (and HIGH TIMES Seed Bank Hall of Fame inaugural inductee) Soma has a great method for this: He gently twists the stems between his fingers until he feels a light crack. Then he carefully bends the stems up to 90 degrees in order to keep them a foot or so away from the light instead of 6 inches or less. Repeat this process as necessary and your buds won't burn before they have a chance to finish. You may even increase your yield by allowing light to reach new leaves that were covered up in the vertical growing style.

POT IN PORTUGAL

Hello, HIGH TIMES! I'm from the country of Portugal and have been a subscriber for almost a year now. I'm very satisfied with everything—it really is magical opening each envelope and smoking my last, best bud of the month while reading and soaking up the wonderful photos and layouts. It's like a ritual now for me, and this is the first time I've decided to write to you.

When using a single 400-watt high-pressure sodium (HPS) lamp going back and forth at a horizontal angle, how fast should the reflector move over the top of the plants, and how far away should it be? Thank you for your answers!

Diana C.

Dear Diana,

Thanks for the kind words about the magazine, and I'm glad you're able to receive it all the way over in Portugal. You're asking about a light mover that uses a track to move your reflector from side to side. The speed of most movers is built into the system, and they typically move quite slowly back and forth. The advantages to using a mover are that you cover more space and can place the light closer to your plant tops, because they have less of a chance of getting burned. Keep your 400-watt HPS reflector about 1 foot (approximately 30 centimeters) away from

the canopy and raise the light or lower the plants as they grow. If you find that you're not getting enough light, switch to a 600- or 1,000-watt light and continue growing under the light mover.

TRIM TIME

When buyers look at my finished buds, they often have to give me some type of criticism as a bargaining ploy. Most of the time, it's the trimming—they say they're not trimmed very close. However, when looking at the green buds before trimming, one can see so much resin on the small leaves sticking out of the buds. These buyers expect me to trim all that off? They say that's what consumers want nowadays; I say that's a waste of about 10 percent to 15 percent of the crop. Besides, when they are dried, the leaves protect the buds.

I worked as a professional trimmer for large growers for 13 years, and my way was the way they wanted it. How can I convince my buyers that this is the correct way buds should be trimmed?

Old Fashioned

Dear OF,

How closely you trim your buds is a matter of personal preference for most growers. Some people like a close trim with very little leaf; others prefer a little leaf left on to protect the buds. Either way, you should decide how you like it and



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The purest hash consists of only glistening trichome heads pressed together.

act accordingly. Don't let a buyer's bargaining ploy change the way you do things. Try it their way once and, if you don't like it, scrap it.

Personally, I would trim as closely as possible and use the leaves you cut off to make hashish. That's because I prefer smoking flowers without the leaf, which can cause a harsher smoke. Instead of convincing your buyers to appreciate more leaf, provide them with some hash made from your sugar leaves and everyone will be happy.

NEWBIE TO NUGS

Let me say right off the bat that I haven't been a regular or devoted reader of HIGH TIMES. I've seen a few issues over the years and have looked at the centerfolds and wanted to taste the big, beautiful buds that were gracing the pages. But now I'm trying to immerse myself in the culture of the cannabis world. I have lived most of my life in the area known as the Emerald Triangle,

My question is this: Have you ever heard of anyone doing genotyping of cannabis strains, and if so, what were the results? I'm currently doing research on this very subject, and have arranged my trip to the HIGH TIMES Cannabis Cup in search of someone else that has done this to hopefully extract some DNA from the

strains they've identified. I have found several papers on this, but they've all been done by government agencies bent on the prosecution of growers, not the identification of individual strains. I have started this process myself, and I'm just waiting for lab results on the 20 strain samples I sent. I've had several debates with growers as to whether or not you can identify anything more than *indica*, *sativa*, *ruderalis* and *afghanica*.

Emerald Triangle Buds

Dear ETB,

I'm looking forward to meeting you in Amsterdam at the Cup. There are now several labs in the US doing testing on the genetics and potency of cannabis, including Steep Hill Labs in Oakland and Full Spectrum Labs in Denver. They use gas-chromatography technology to determine the percentage of THC, CBD, CBN, and the many other cannabinoids and terpenes. They are also able to detect powdery mildew, molds, insecticides and overfertilization. They've even begun to map the genetic makeup of the various strains in order to standardize them and certify that certain varieties are what they claim to be. These exciting discoveries have opened up many new avenues to learning more and more about cannabis. There's a wealth of information that we still don't know

about this wonderful plant, and I encourage you to learn as much as you can.

CLONE WARS

I've been growing for some time now, and I've noticed that sometimes after I clone, there's a period of time that the clones grow leaves with only three blades. I haven't been able to figure this out. The plants are still very vigorous, but only produce three-bladed leaves. Could you please tell me why this is?

Annoyed in Colorado

Dear Annoyed,

The reason the plants are growing leaves with only three blades is because the process of cloning causes stress to the cuttings, which transfer their resources into growing roots to stay alive. Think about it: You're cutting a piece off a growing plant and then forcing that piece to create roots and grow on its own. This technique is bound to hurt the cutting, and its fearful reaction to pain causes it to only put out enough leaves to survive this trying time.

Eventually, once the clones have developed sufficient root systems and have been planted into a growing medium, the new shoots should have more blades per leaf jutting out from the stem. That's how you know the clones have recovered from the stress of being cut from the mother plant and that they're ready to begin the vegetative stage of life.

HASH MADE EASY

I was wondering if you could give me a few easy tips for making hash at home.

Buck

Dear Buck,

The easiest way to make hash at home is by breaking up your buds over a screen and then pressing together the powder that falls through the holes. This is known as dry-sift hashish and, with a bit of practice, you can use just your fingers to warm and melt the tiny gland heads into a malleable mass.

If you're a grower, you can also use the leaf trim generated during the harvesting process to make ice-water-extracted hash. Sugar-leaf trim is tossed into a bucket filled with ice water into which bags lined with various sizes of silkscreen have been placed. After 15 minutes or more of agitation, the first (top) bag is removed, carrying with it all of the leafy material. The next several bags pull out various gradations of yellowish-brown trichome heads and stalks that resemble a slurry of wet sand. Once it's all collected, the moisture must be removed through pressing and drying to form bubble hash, an extremely potent form of hashish that can melt even when slightly warmed.

NEWBIE BUDS

When should I start growing? Can I just throw some seeds in the dirt with sunshine and water? I'm a newbie who's sick of spending his hard-earned money on dealers, and I'd just like to have my own pot!

War X

Dear War X,

When you should start growing outdoors depends on the region in which you live. The optimum time in most parts of the US is after any threat of frost, but before the heat of summer. Growers in

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Male flowers protrude
from a female bud on
this hermaphroditic
pot plant.

warmer climates can plant early in spring (March), while farmers in colder regions should wait until late April or May to set seed.

You grow plants with dirt, sunshine and water, but in order to optimize your harvest, you'll want to put a bit more effort into the project. I applaud your desire to become dealer-free, but I don't want to mislead you into believing that growing your own is easy. You only take out what you put in, so consider it more of a part-time job than a hobby and you'll be righteously rewarded.

SEXING MOTHER PLANTS

I plan on growing from clone, starting my mothers from regular/non-feminized seed. I'm wondering what would be the best technique for sexing the mothers: Would it be to first flower them out, then revert them back to the vegetative stage? Or would that be too much stress for a mother plant? Perhaps it might be better to take clones before flowering the moms and then determine sex from the clones. However, that option would be extremely inconvenient for those of us trying to follow state guidelines with regard to plant limits.

Richard

Dear Richard,
Unfortunately, the latter solution is clearly the best one. Mother plants suffer stress when they're flowered in order to determine sex and then reverted back to vegetative growth. The confusion caused by this unnatural process can

result in slowed growth, twisted leaves and other negative symptoms.

On the other hand, determining the sex of the mother plant by taking a cutting and flowering it out will not stress the mother plant, which can continue growing in its vegetative stage throughout this process. Taking the cutting from the main stem of the mother plant will help it stay bushy as well, a very important characteristic to consider if space is a concern.

Some states with plant limits only restrict the number of flowering plants you can have—but if yours doesn't, keep in mind that the cutting only needs to tell you the sex of its mother and can be discarded shortly thereafter, limiting your potential time at risk to a couple of weeks.

CHOPPER STOPPER

I'm a 65-year-old first-time grower. This year I harvested five plants that did well in my backyard. My concern is about the air above my home: How are plants detected from a plane or helicopter? Also, you should put "Answers by Danny" in book form—I've learned more from Dear Danko than from grow books and videos.

P.B.

Dear P.B.,
Thanks for the compliment. As for your garden, I wouldn't worry too much about your five plants being discovered by choppers or planes. Law enforcement typically targets much larger gardens

for surveillance and destruction, and I sincerely hope they have better things to do than worry about a 65-year-old with a few plants in his yard. Sadly, that isn't always the case, of course, but I'd be more concerned about the neighbors or local kids discovering your plants than the fuzz from above.

HELLISH HERMIES

I have a closet grow box, and two of my plants have turned hermaphrodite on me. I asked some people and they all told me that somehow light must have gotten into my box. I believe them, because the two plants affected were closest to the door. My question is: If such a small amount of light can do this to a closet grow, how do people keep their outdoor plants from turning hermaphrodite when there is a full moon or bright stars? I'm planning to grow a couple plants outside and would like to know if I need to cover them at night.

Jordan C.

Dear Jordan,

It's true that light leaks can cause female plants to become hermaphrodites and exhibit male flowers, potentially seeding your crop with practically useless beans instead of sinsemilla buds ("without seeds" in Spanish). If the plants receive strong light during their "night" cycle, when the lights are supposed to be turned off, they do react with shock, and the resulting stress can manifest itself in hermaphroditic tendencies. A small amount of dim light is usually insufficient to cause this reaction, however; it tends to happen more often when bright light interrupts the dark cycle for an extended period of time (i.e., 15 minutes or more).

Outdoors, the natural night cycle includes light from the moon and bright stars, which doesn't affect the plants because it's not bright or shocking enough—only a streetlight or motion-detector floodlight can really disrupt the outdoor dark cycle, since plants are attuned to withstand small, dull, distant amounts of light throughout the night. So avoid planting near artificial sources of light, but don't worry about the natural glow of the moon and stars.

ELECTRIC COMPANY

I have an ebb and flow hydroponic system on a 4'x8' table of clay rocks. I'll be using two 1000-watt HPS lights with electronic ballasts. So my question is, with all of that electricity flowing of lights, pumps, fan, CO2, and etc., should I have a professional electrician wire it up or can I just use heavy duty surge protectors, extension cords and just use the wall outlets (120v).

C-Money

Dear C-Money,

The vast majority of the electricity you will use will be for the two 1000-watt lights and ballasts. Each one needs approximately 9 amps to run without popping your breaker. As long as you can dedicate a 15 amp or higher circuit to each light, you will be fine. It's always better to have a certified electrician do your wiring, but in your case, you can handle it yourself, as long as you don't plug both bulbs into the same outlet or have them running on the same 15 amp breaker. ✪

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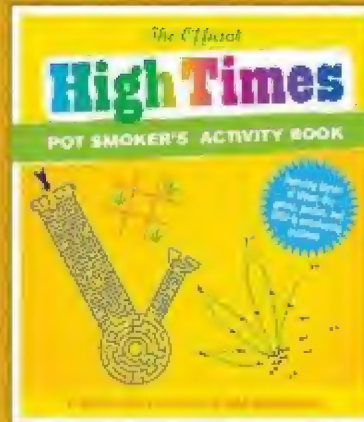


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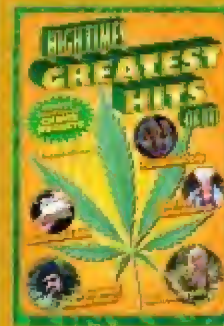
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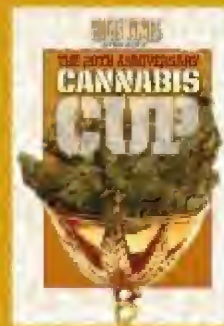
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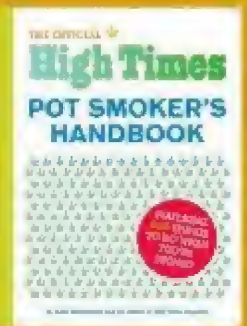
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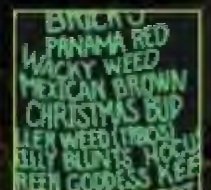
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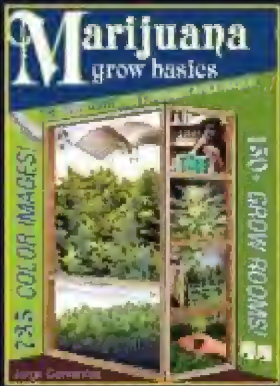
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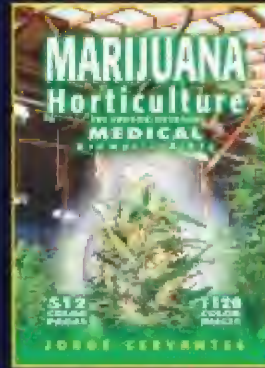
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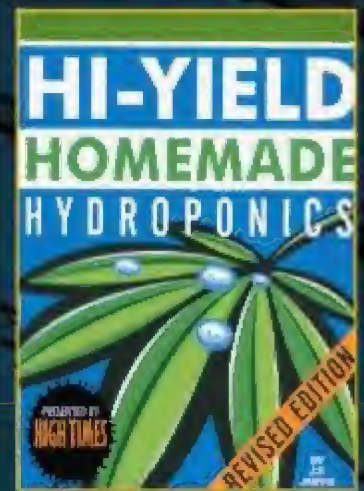
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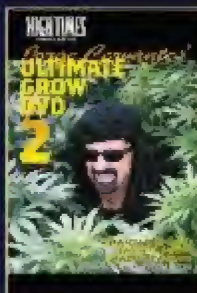
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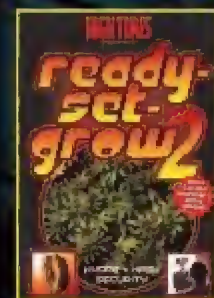
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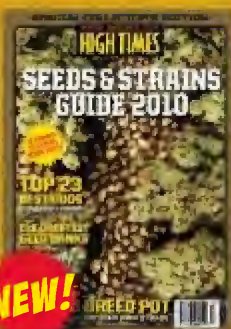
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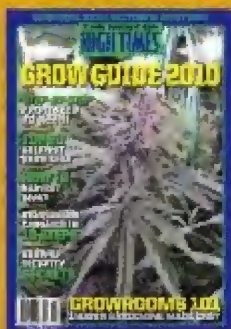
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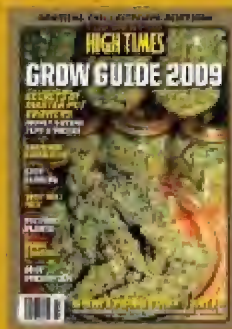
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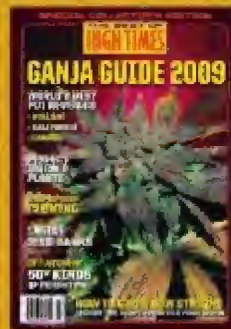
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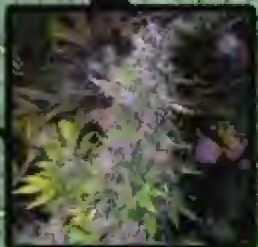
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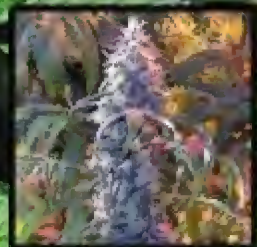
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